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MEDICAL MANAGEMENT OF BLEEDING GASTRIC AND DUODENAL ULCER

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CHARLOTTE

Hemorrhage is the most common complication of peptic ulcer. The management of hemorrhage of gastroduodenal origin, therefore, is a problem which is always with us. In the treatment of massive gastro-intestinal hemorrhage there have been so many "voices crying in the wilderness" that the "straight path" has been indeed difficult to recognize. In reviewing the literature of the earlier therapeutic efforts directed against gastroduodenal bleeding, the reader is struck with the intense controversy existing over the treatment of choice, and is gradually forced to concede that frequently a new form of therapy has but enabled the physician to obtain the previous unsatisfactory results by a greater variety of methods.

The chief purpose of this presentation is to call attention to the more recent trends in the management of the bleeding ulcer and to suggest that the slowly falling mortality rate and the crystallization of opinion around a few fundamental concepts in this problem herald a more satisfactory management of these cases[1, 2].

The older method of therapy in gastroduodenal bleeding was a period of starvation, morphine and immobilization, varying from forty-eight to sixty hours, in which even oral fluids were withheld. Following this period of starvation various anti-acid mixtures were used, together with the cautious administration of milk and cream. Upon this regimen, widely known as the Sippy program, the patient was ushered in upon a period of exhaustion and apprehension which was promoted and maintained by thirst, hunger and immobilization. This method of treatment gave an average mortality rate for 5843 cases[3] of 8.7 per cent, while in some individual reports the mortality ran as high as 26 per cent. These figures clearly demonstrate that this program of therapy left much to be desired. If surgery was employed, the mortality figures were even higher; 383 cases[3] submitted to surgery gave a mortality of 28 per cent.

Andresen[4] in 1927 criticized the starvation regimen as being unphysiologic, and recommended prompt and adequate feeding. He presented no figures to substantiate his concept, and unfortunately it gained few converts. Meulengracht[5] in 1933 observed, as had Andresen before him, that regardless of how scrupulously the starvation program was adhered to, many patients died on the fifth or sixth day even though their bleeding had stopped. He also recognized that many ambulatory patients who remained at home and ate as they chose did well. In short, he

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Read before the Section on the Practice of Medicine, Medical Society of the State of North Carblina, Pinehurst, May 20, 1941.

1. Chasnoff, Julius, et al.: An Evaluation of the Meulengracht Regimen in the Treatment of Bleeding Peptic Ulcer, Am. J. Digest. Dis. 7:373, (September) 1940.

2. Finsterer, H.: Operative Treatment of Severe Gastric Hemorrhage of Ulcer Origin, Lancet, 2:303 (August 8) 1936.

3. Miller, T. G. and Elsom, K. A.: The Management of Massive Hemorrhage From Peptic Ulcer, M. Clin. North America, 22:1711, 1939.

4. Andresen, A. F. R.: The Treatment of Gastric Hemorrhage, J. A. M. A. 89:1397 (October 22) 1927.

5. Meulengracht E.: Treatment of Hematemesis and Melena, Proc. 16th Scandinavian Congress for Internal Med. 1933. Arch. Med. Scandiv. Supp. 59:35, 1934.

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felt that the Sippy regimen, with its resulting nutritional and vitamin deficiency states and its potential danger of alkalosis, did little or nothing to correct the physiologic changes produced by a massive hemorrhage. He, therefore, advocated a prompt feeding program beginning from the onset of the hemorrhage and giving the patient six feedings a day, along with alkalis, and iron. Meulengracht's program embodies one of the fundamental principles in the treatment of disease—namely, placing as nearly as possible at complete rest the diseased or impaired tissue. To this end we immobilize the fracture, we subject the tuberculous lung to pneumothorax. However, until recently this fundamental concept had been completely ignored in the treatment of gastric and duodenal bleeding. Starvation had been the order of the day, even though Carlson[6] in 1916 and other clinicians since have conclusively demonstrated that the empty stomach is in frequent rhythmic contractions, while the full stomach is relatively inactive.

A review of the literature as reported by Nicholson[7] shows that a mortality rate of approximately 3 per cent has been obtained in 1500 cases of massive hemorrhage from ulcers which were treated by prompt and adequate feedings.

A comparison of the available mortality figures of the older regimen and the more recent feeding programs would appear on the surface to be decidedly favorable to the newer form of therapy. However, it is, in my opinion, yet too soon to draw any iron-clad conclusions. The statistics concerning the treatment of bleeding ulcer have always been confusing. One author reports a 26 per cent mortality, another a 3 per cent mortality, under the same method of treatment. Obviously, they are not dealing with the same type of hemorrhage. Before the mortality tables can be relied upon too implicitly the age factor of the patients being reported must be considered. A massive hemorrhage in the young does not carry with it the same prognosis as a hemorrhage of the same degree in an elderly person. The number of hemorrhages the patient has had is also significant. While fatal hemorrhage may occur in the first bleeding episode, death is more common in persons who have had previous hemorrhage. Of course the degree of hemorrhage is important, but as yet we have no definite standards as to what constitutes a massive hemorrhage. What to one author may be "severe" is perhaps to another a moderate hemorrhage. Therefore I caution you to accept with some reservation the contention of those who would lead us to believe that the feeding program in bleeding ulcer has brought about a reduction in mortality comparable to the reduction in the mortality rate of pneumonia under sulfathiazole therapy.

This much, however, can be said: the patient on a modified Meulengracht diet is certainly more comfortable, more cheerful and easier to handle than a patient on a starvation program. Numerous patients who have previously been treated by the Sippy method, when they are put on a modified Andresen program voluntarily comment upon the comfort and ease of this latter regimen. Of course, in evaluating any form of therapy the comfort of the patient is not the prime consideration. It is, however, a factor. Therefore, it is safe to say that as the mortality in bleeding ulcer with the feeding program is certainly no worse and is perhaps better than that obtained with a starvation regimen, and since all agree that the former method is a less arduous and depressing experience for the patient, the giving of adequate food is at the present time the treatment of choice.

The patient upon entering the hospital (and all patients with significant gastro-intestinal bleeding should be hospitalized) should be given absolute bed rest. An adequate history and physical examination should be obtained whenever possible. After these preliminary steps, nembutal in the form of a suppository should be given until the patient is definitely drowsy. However, he should respond to moderate stimuli so that he may continue his frequent feedings. In my opinion nembutal is superior to morphine or its allied substitutes. In the first place, morphine will produce or prolong vomiting in a significant number of patients, while nembutal does so rarely, if ever. Second, Abbott[8] has shown that while morphine produces a temporary increase in the

6. Carlson, A. J.; Lebensohn, J. E.; and Pearlman, S. J.: Has Secretin a Therapeutic Value? J. A. M. A. 66:178 (January) 1916.

7. Nicholson, J. T. L.: Ready for publication.

8. Abbott, W. O., and Pendergrass, E. P.: Intubation Studies of the Human Small Intestine: V. The Motor Effects of Single Clinical Doses of Morphine Sulphate in Normal Subjects, Am. J. Roentgenol. 35:289 (March) 1936.

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tonus of the small bowel, this is followed by a prolonged period of abnormal relaxation, which theoretically is not conducive to hemostasis. Unless the indications for its use continue, nembutal should be stopped by the second or third day.

Feedings are begun as soon as possible after the patient enters the hospital. The fact that the patient is nauseated is not a contraindication to the administration of food. Indeed, it is not uncommon for a patient who has been vomiting repeatedly to cease vomiting after feedings have been begun. There is an occasional patient who will vomit every time he is fed, and in such cases it is folly to continue the use of food. I have not used the full Meulengracht program in private practice, as it appears to me that this diet uses some foods during the *acute* phase of an ulcer which would not be used in the treatment of an ordinary ulcer. I have found a modification of Andresen's program very satisfactory. It begins with a bland, non-irritating type of diet, high in proteins and at the same time maintaining adequate caloric intake. This is gradually stepped up to a full ulcer diet on the eighth or ninth day. The exact type of food given is less important in my opinion than that food *be given.* Water is allowed in small quantities as desired. I have not felt that the use of snake venom or other so-called hemostatic agents is worth while.

The question of whether or not these patients should be given transfusions has never been definitely settled. Recently the pendulum has swung toward the more frequent use of transfusions. However, hemorrhage is not in itself an indication for giving blood, and unless shock occurs it is unwise to give transfusions for at least sixty or seventy-two hours after bleeding has stopped. After this period, small transfusions may shorten the period of convalescence. Plasma may be safely substituted for blood with equally salutary results if shock occurs, as it is restoration of circulating blood volume rather than red cells which is important in post-hemorrhagic shock.

The use of anti-spasmotics as a routine measure is not necessary. However, if there is an unusual amount of abdominal discomfort, anti-spasmotics such as atropine sulfate solution 1:1000 may be resorted to. Also the use of anti-acid powders is not necessary, as the gastric acidity is well controlled by feedings. If, however, an anti-acid is indicated, insoluble preparations such as magnesium trisillicate should be used. The use of the old soda bicarbonate mixtures may be a factor in the disturbed chemical condition of the patient.

In the management of these bleeding cases the question as to the advisability of surgery frequently arises. The best surgical opinion is that surgery should be reserved for those cases where there is clear-cut medical failure or for cases with associated complications which in themselves are definite surgical indications. There are undoubtedly cases in which surgery is indicated, but it is difficult, if not impossible, to select these cases during the first forty-eight hours—which period is universally conceded to be the optimum time for surgical attack. The individual doctor's attitude toward surgery in these cases will depend somewhat upon his philosophy toward surgery in general.

A continuous drip of aluminum hydroxide is advocated by Woldman[9] in the management of upper gastro-intestinal bleeding. His contentions are that aluminum hydroxide promotes hemostasis and gives a continuous neutralization of the gastric acids. However, as his own mortality figures are no better than those with other newer forms of therapy, I see little advantage in subjecting the patient to the discomfort of an indwelling catheter. The mechanical difficulties in keeping the aluminum hydroxide from occluding the lumen of the tube are considerable. The second disadvantage of such therapy is that aluminum hydroxide is constipating, and I have seen many fecal impactions occur during its use. The use of ascorbic acid in some form is important, as many investigators have shown that the majority of bleeding ulcer patients are deficient in vitamin C.

The management of massive gastro-intestinal hemorrhage of necessity requires much individualization. Mortality figures are reduced in direct proportion to the amount of attention paid to the patient. An author recently claimed to have reduced the mortality figures in his hospital from 26 per cent to 6 per cent by using a feeding program. In my opinion a 26 per cent mortality rate is too high for any program.

9. Woldman, E. E.: The Treatment of Massive Gastro-Duodenal Hemorrhage by the Continuous Administration of Colloidal Aluminium Hydroxide, Am. J. Digest. Dis. 8:39 (February) 1941.

Could it be that the apparent reduction in his mortality rate was due as much to the increased interest of the physicians, and consequent increased attention to the patient, as to his change to a feeding program?

No form of therapy should be considered complete until an effort is made to insure the patient against hemorrhage in the future. To this end it is important that long before the patient leaves the hospital a program of re-education should be begun. The ulcer patient should be urged to realize that he must change his philosophy of life; that "business as usual" must give way to "business and pleasure" within his emotional and physical capacity. He should have adequate chance to appreciate that the price of security is vigilance and sacrifice; and that just as surely as pulmonary tuberculosis forces upon its victims certain reductions in activity, so does duodenal ulcer, if it is to be successfully managed.

Abstract of Discussion

Dr. Walter R. Johnson (Asheville): Ordinarily in the discussion of a medical paper, I like controversy. I think every one learns more by such a discussion. Unfortunately, I can't take issue with Dr. Reid in any of the points that he made. I agree wholeheartedly with his management of bleeding peptic ulcers. His program is almost identical with the one I use.

I believe that frequent small feedings are indicated. I believe that nembutal is far superior to morphine derivatives. I do use anti-acid mixtures with milk and cream diet.

Since I can't disagree with him, I'd like to reiterate a few points. First of all, if you read statistics carefully, you will find that death from bleeding ulcer is exceedingly uncommon in patients of less than 45 or 50 years of age, regardless of the type of treatment—that is, unless surgery is employed. It is in patients who are getting into the fifth decade that the mortality becomes significant. As we grow older there is a stiffening in the blood vessels and it is impossible for the arteries to function as usual. They do not retract and the patient may bleed to death. What should you do in such a case? If you have the services of a master gastric surgeon, it may be possible to decide after twenty-four hours that the patient will bleed to death unless he is operated on, and you may save his life with surgery. However, most of us are forced to adopt a conservative point of view, even in these old people. The majority of them, even in the fifth and sixth decades, will survive. Then, after they recover from the hemorrhage, they can be subjected to a large scale gastric resection, together with resection of the ulcer portion of the duodenum. After an interval of good health, they will probably survive such an operation, but if it is performed within two or three days after the hemorrhage, the mortality is very close to 100 per cent unless the work is done by an acknowledged master.

So I think that all of us are forced to adopt the program that Dr. Reid has so clearly outlined.

Dr. J. S. Brown, Jr. (Hendersonville): I want to compliment both of the gentlemen on their discussions of bleeding ulcers.

I would like to know if Dr. Reid thinks internal hemostasis is worth anything?

I also want to protest against his remarks about Sippy's "starvation treatment". I never heard of anybody's starving to death on a half pint of milk every two hours.

Dr. Elias Faison (Charlotte): I would like to ask Dr. Reid whether he gives vitamin K if the prothrombin is low.

Dr. Royster: I would like to ask Dr. Reid if he uses an ice cap.

Dr. H. C. Taylor (Charlotte): I would like to hear some more comment as to when an x-ray should be made. Sometimes it is difficult to decide just when to make the picture.

Dr. Mitchell: I would like to know how to differentiate in the treatment of marginal gastric ulcers and duodenal ulcers.

Dr. Reid: Mr. Chairman, I want to thank the gentlemen very much for their remarks.

Dr. Johnson brought up the question of surgery. We have been so drastic in our accusations against surgeons here this afternoon that I think something should be said in their favor. With reference to bleeding ulcers, I think that, if a hemorrhage occurs several times the question of surgery should be very carefully considered, particularly when a patient has reached the age of 45 or 50.

Dr. Brown spoke about calcium and other hemostatic types of medication. I have never thought they were worth anything at all. At autopsy of a case that has come to a fatal termination, it is difficult to see how any medication could possibly stop the bleeding. Frequently there is a tremendous artery in the central part of the ulceration, and I am sure that no calcium or any hemostatic agent could be effective.

As to Dr. Faison's question concerning prothrombin as a routine, I don't make any routine prothrombin level determination unless there is some evidence of liver damage or biliary disease.

I don't think ice on the external part of the abdomen would have any effect on the bleeding. I don't believe the local change in temperature would get to the gastric wall.

In answer to Dr. Taylor's question as to when x-ray studies should be made: As a general rule there is no need for particular haste in x-raying a patient who has had an upper gastro-intestinal hemorrhage. X-ray studies immediately following a hemorrhage will frequently not give any additional information, as the ulcer crater is often obliterated by the blood clot. If the patient continues to bleed and surgery is being considered x-ray may be helpful in making a differential diagnosis. Even if you suspect a malignancy of the stomach, immediate x-ray is not necessary as you will probably defer surgery in any case until the patient has recovered from the immediate effects of his hemorrhage. If the history of the case suggests lesions such as esophageal varicosities of course x-ray studies are helpful. I usually wait three weeks to make x-rays unless there are indications for earlier studies.

Dr. Mitchell asked about the difference in treatment between a marginal and duodenal ulcer. Surgery in the marginal ulcer case may play a more prominent role, but there is little difference in medical management. I feed both alike. Of course I do not believe the feedings actually arrest the hemorrhage. Giving of food simply keeps the patient in the best physiologic state to combat the effect of hemorrhage and avoids deficiency states.

CESAREAN SECTION: ITS INCIDENCE AND FETAL MORTALITY IN SOME CITIES IN NORTH CAROLINA

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WINSTON-SALEM

Cesarean section has been the means of salvaging many lives since Sanger in 1882 urged a rapid operation with sutures of the uterine incision under antiseptic precautions. Advance has been made not only in asepsis and anesthesia, but also in surgical technique. The low cervical operation, or laparotrachelotomy, popularized by DeLee, is now the operation of choice by most obstetricians whenever the conditions are suitable. For the contaminated cases the Latzko extraperitoneal operation, or the more recent Waters supravesical extraperitoneal cesarean section[1] are the procedures of choice.

It is often the case in medicine that whenever a procedure becomes fairly safe there is a tendency to overstep the bounds of indications and apply the procedure indiscriminately. It is true that under ideal conditions, with an experienced operator, the mortality for elective sections, according to Schumann[2] is less than 1 per cent, and is comparable to the death rate in interval appendectomies and other simple intraperitoneal operations; however, the operation is still not a procedure of convenience, nor a method to avoid delivery from below. Schumann's incidence of cesarean section is 1.6 per cent of all deliveries[2].

It was with the thought that some communities and even some doctors have become cesarean section conscious that this study was made. I will try to point out why the incidence in certain cities is so great, and also to show that while the operation may be safe for the mother, it does not guarantee a living child, as one might have been led to believe. This study also shows that we in North Carolina have not achieved a mortality as low as 1 per cent.

Table 1 is taken from the Duke Endowment report for the Hospital Section of North and South Carolina. The 1927 report covers only fifty-eight hospitals, and the 1937 report covers one hundred and nineteen hospitals. The incidence of cesarean section has remained about the same, and the maternal mortality has been reduced by half. The lowered figure may be attributed to improvement in facilities, asepsis, technique, and judgment. It is important to note, however, that the fetal mortality, even with these improvements, has remained about the same.

	1927 58 Hospitals		1937 119 Hospitals	
Deliveries	5,170		17,052	
Sections	290	5.6%	897	5.2%
Mat. Mort.	26	8.9%	40	4.5%
Inf. Mort.	47	16.0%	167	19.0%
Stillbirths	32	11.0%	90	10.0%

Table 1. Duke Endowment Report of the Hospital Section of North and South Carolina.

Arnold, making a study of thirty authors[3], showed that the national incidence of cesarean section from 1931 to 1939 was 2.5 per cent of all deliveries, with a maternal mortality of 4.6 per cent and a fetal mortality of 8.8 per cent. In this state we are doing twice that number of cesareans and getting twice the fetal mortality.

Table 2 shows the incidence of cesarean section in the larger cities of North Carolina. The number of deliveries represents all the hospital deliveries in each city. A comparison for 1938 and 1939 is given, because it is possible that a high incidence for one year might be an accidental finding.

	Number of Deliveries		*Number of Sections*		*Percent. of Sections*	
YEAR	1938	1939	1938	1939	1938	1939
Asheville	663	643	36	32	5.4	4.9
Charlotte	1581	1741	60	52	3.7	2.9
Durham	1258	1342	57	34	4.5	2.5
Greensboro	565	614	54	54	9.5	8.7
High Point	270	6346	11	8	4.1	2.3
Raleigh	733	829	26	36	3.5	4.3
Wilmington	958	1052	31	37	3.2	3.5
Winston-Salem	1083	1289	67	97	6.2	7.4
TOTAL	7111	7865	342	350	4.8	4.4

Table 2. Incidence of cesarean section in North Carolina.

I wish to call attention to the high rate of cesarean sections in Greensboro and Winston-Salem. The two cities together account for more than one third of all the cesarean operations in the state, whereas their total deliveries represent less than one fourth the state total. What accounts for this large percentage?

Dunn, reviewing the incidence of cesarean

Read before the Section on Obstetrics and Gynecology, Medical Society of the State of North Carolina, Pinehurst, May 21, 1941.

1. Waters, E. G.: Supravesical Extraperitoneal Cesarean Section: Presentation of a New Technique, Am. J. Obst. and Gynec. 39:423 (March) 1940.
2. Schumann, E. A.: Critique of Factors Involved in Cesarean Section Mortality, Am. J. Obst. and Gynec, 37:212 (February) 1939.
3. Arnold, Lawrence E.: Cesarean Section: Comparative Study, Am. J. Obst. and Gynec, 40:603 (October) 1940.

section in Greensboro for the years 1935-1938[4], found it to be 11.6 per cent. He felt that this was extremely high. The indications were many and varied and included a dead fetus.

I reviewed the chart of every cesarean section case in Winston-Salem for 1938 and 1939. The indications for section ranged from low blood pressure to tumor of the larynx. Contracted pelvis, with no measurements recorded, headed the list, as usual; but it was surprising how often there was the history of a previous normal delivery of a child weighing more than the baby delivered by cesarean section.

The surgeons in Greensboro have been blamed by some for the high incidence of cesarean operations. One is willing to grant that the surgeon is more skilled in abdominal surgery than the obstetrician, but surely one does not grant that his obstetric judgment is as good. He delivers by his best method, cesarean section; for he knows little or nothing about delivery from below. In Winston-Salem, the obstetricians were responsible for twice as many cesarean operations as the surgeons in 1938 and three times as many in 1939. Omitting the surgeons' cases in 1939, the incidence would still be over 5 per cent. The indications for section given by the obstetricians were no better than those of the surgeons, but their maternal mortality was definitely less.

Most authorities agree that the incidence of cesarean operations should not be above 5 per cent of all deliveries[5]. In hospitals where much higher percentages are found, obstetric judgment is presumably deficient.

Table 3 shows the maternal and fetal mortality from cesarean section for the same North Carolina cities. As this paper deals chiefly with fetal mortality, I wish to call attention only briefly to the maternal mortality, in order to point out that it is too high and that risk of delivery from below in this series was only one sixth to one eighth as great as the risk of section. The fetal mortality is extremely high. More than one out of ten babies fail to survive the operation. While some may boast that they have never lost a mother by cesarean section, surely no one can say this about the baby. The infant death rate from vaginal delivery

	Mat. Mort.		*Percent.*		*Inf. Mort.*		*Percent.*	
YEAR	1938	1939	'38	'39	1938	1939	'38	'39
Asheville	0	0	0	0	3		8	
Charlotte	1	1	4	3	8		14	
Durham	4	1	7	3	13	20*	22	45*
Greensboro	3	1	6	2	4		8	
High Point	1	0	9	0	0		0	
Raleigh	1	3	4	4	3		11	
Wilmington	1	1	3	3	3		9	
Winston-Salem	2	3	3	3	12	13	18	14
TOTAL	13	10	4	4	46		14	

Infant mortality by vaginal delivery 8 per cent. Omitting stillbirths 4 per cent.
Maternal mortality following vaginal delivery 0.6 per cent.
* Duke Hospital only.

Table 3. Maternal and fetal mortality from cesarean section.

shows that this method, whenever it can be used, is still the safest.

Table 4 is an analysis of the deliveries in the cities having the largest fetal mortality. It will be noted that the incidence of cesarean section and the fetal mortality were high at Duke in 1938, but it must be remembered that a large proportion of their cases are referred and that it is more or less a dumping ground for the neglected and misfortunate patients in a large surrounding territory. In neglected or rare cases it stands to reason that the fetal mortality should be high.

There were twenty fetal deaths at Duke Hospital following cesarean section in 1938 and 1939. In eight of these cases the infant was premature and the operation was performed to interrupt pregnancy for the sake of the mother, with no thought of obtaining a living child. In three cases there had been severe toxemia of pregnancy; two of the infants were stillborn. Five deaths, all stillbirths, occurred from abruptio placentae. Two deaths, both being stillbirths, occurred in postmortem cesarean sections. One neonatal death was from a secondary cesarean. The autopsy showed congenital atelectasis. One death was neonatal, autopsy showing bilateral atelectasis. In this case the operation was done on a woman with postoperation pelvis and postradiation goiter. In this group of deaths, even if delivery from below had been possible, it is doubtful that the infants would have lived, except in two or three cases.

In Winston-Salem the City Memorial Hospital includes the colored hospital (Kate Bitting Reynolds Memorial), and cares for the charity cases of the city, as well as a large number of private cases. The Baptist Hospital has very little obstetrical charity, and in the above figures only one section was done on a charity case. The rest are private

4. Dunn, Richard B.: Saint Leo's Hospital Bull. (May) 1939.

5. Titus, Paul: Cesarean Section, Its Relation to Maternal Mortality, New York State J. Med. 39:1173 (June 15) 1939.

HOSPITAL . .	WINSTON-SALEM CITY		WINSTON-SALEM BAPTIST		DURHAM DUKE	
YEAR	1938	1939	1938	1939	1938	1939
Deliveries	545	760	538	552	546	656
Sections	28	32	39	65	41	20
Percent. Sections . .	5	4	7	11	7	3
Mat. Mort.	2	3	0	0	4	2
Percent. Mat. Mort.	7	9	0	0	10	10
Inf. Mort.	8	7	4	6	11	9
Percent. Inf. Mort.	26	22	10	9	27	45
Stillbirths	2	3	0	1	9	3
Percent. Stillbirths	7	9	0	2	22	15

Table 4. Analysis of deliveries in hospitals having the largest fetal mortality.

cases, with adequate prenatal care. It is, therefore, somewhat surprising to see the high incidence of cesarean section in this type of practice. This group should give us practically no fetal mortality if cesarean section is always safe for the child.

There were fifteen fetal deaths at the City Hospital among cesarean section cases in 1938 and 1939. The operation apparently was necessary in eight cases. The other seven cases are open to criticism. Seven out of the fifteen operations were necessary for the immediate welfare of the mother.

Three deaths occurred with abruptio placentae, all the infants being stillborn. Four deaths occurred with placenta praevia, all the deaths being neonatal; three were due to prematurity. Two deaths were from hydrocephalus and spina bifida. In these cases a cesarean should never have been performed. Two deaths were attributed to toxemia of pregnancy; however, from the record it seems that the operation was performed for sterilization and not because of the toxemias, which were mild. Two deaths occurred in full term infants. In both cases section was done for contracted pelvis, although both women had had children previously by the vaginal route. One of them, however, had recently had a plastic repair. Autopsies of these infants showed hemolytic anemia and hemorrhagic disease. Two deaths occurred in a postmortem cesarean. The death of the mother was due to eclampsia, and both infants were stillborn. One death was due to prematurity from a hysterotomy on a six-months fetus.

The Baptist Hospital had ten fetal deaths from cesarean section in 1938 and 1939, an incidence of 10 per cent. Only three of these operations had adequate indications, the other seven being open to criticism. Nine deaths were neonatal, the infants living from one to forty-eight hours. One child was stillborn.

Five neonatal deaths may be attributed to prematurity, but it is interesting to note that in only one case was the operation done in the interest of the mother, and this was a psychiatric case in which pregnancy was interrupted at seven months. In the other four cases the doctor completely misjudged the age of the infant. They were elective cases, with no indication for immediate operation. In two cases the indication listed was toxemia of pregnancy, which was quite mild. The third case was for contracted pelvis; however, the patient had been delivered previously per vagina of an infant weighing 5 pounds, and the cesarean baby weighed only 3 pounds, 13 ounces. The fourth section was done because the patient had only one kidney. Urine examination, however, showed a specific gravity of 1.024 and no albumin; her blood pressure was 125 systolic, 70 diastolic.

Four neonatal deaths are not explainable. One occurred in a cesarean operation following a trial labor of five hours, the indication being cephalopelvic disproportion. One followed an elective cesarean done because of previous third degree tear, which had been repaired. The other two deaths occurred following elective operation for which no reason was given. All four infants were at term, according to their weight.

The one stillborn infant was in a case of abruptio placentae.

It is true that stillbirths resulting from premature separation of the placenta account for a number of deaths in this small series. This, of course, is an unavoidable accident. It is also true that a large number of neonatal deaths resulted from prematurity of the infant, and that some of these deaths could have been prevented.

Some of the deaths might have been due to a cerebral injury, which can occur in an abdominal operation. Brander[6] found 72 cases of intracranial lesions verified postmortem in children delivered by cesarean section. In some of these cases a tearing of the tentorium was discovered. He lists these causes for fetal mortality: (1) Too short an incision, which may increase the danger of an intracranial lesion; (2) extraction by the feet, which seems to be more dangerous than freeing the head first; (3) instrumental development of the head; (4) too violent

6. Brander, T.: Ueber zerebral defekte Kaiserschnittskinder, Acta paediat. 28:145, 1938.

resuscitation; (5) asphyxia; (6) anesthetics.

DeLee[7] states that some babies are lost even when local anesthesia is used. So far he has found no explanation for this, but he suggests that the liquor amnii, which is more apt to be squeezed out of the lungs during a vaginal delivery than in abdominal delivery, may play a big part. He believes that a cesarean done when a woman has been in labor for some time is less likely to deliver an asphyxiated baby (other things being equal) than an elective cesarean.

Conclusions

From this small survey, it would seem that too many cesarean sections are being done with inadequate indications, and that the fetal mortality, even under ideal conditions, is too high. If we are to lower our mortality from cesarean sections, we must pay more attention to the contraindications, which are[8]: (1) A dead child, except in the presence of an absolute pelvic indication; (2) poor physical condition of the mother; (3) improper surroundings for aseptic technique; (4) acute infection within the birth canal. Finally, as Kanatser has stated[9], "The most important contraindication to cesarean section is the performance of an operation without valid indications. In other words, the operation should never be performed until a very careful study of the recognized indication and contraindication has been made from the standpoint of immediate and remote mortality and morbidity of the patient, with delivery by cesarean section as compared with other methods of delivery. We should advise cesarean section in the interest of the patient and not for the convenience of ourselves. Furthermore, cesarean section should not be employed as a means of last resort, after the mother is exhausted, nor should these operations be done by a physician because he does not know how properly to overcome dystocia by vaginal manipulations. Such physician should call into consultation an obstetrician or a physician experienced enough in obstetrics to decide properly whether or not an abdominal operation is necessary."

7. DeLee, Joseph B.: The 1940 Yearbook of Obstetrics and Gynecology, Chicago, Year Book Publishers, Inc., 1940.

8. Phaneuf, L. E.: Progress of Cesarean Section, Am. J. Obst. and Gynec. 40:603 (October) 1940.

9. Kanatser, J. E.: Indications and Contraindications for Cesarean Section, South. M. J. 33:1023 (October) 1940.

PUBLIC HEALTH PROBLEMS CREATED IN FLOOD DISASTERS

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From the mountains to the sea during the last fateful days of August, 1940, the rivers in the northwestern and northeastern sections of North Carolina went on a roaring rampage, destroying homes, crops and bridges, and sweeping away practically everything in their devastating paths, to leave scenes of desolation and despair such as had not been witnessed in these parts of our Southland since the ravages of the Civil War.

At Weldon the Roanoke River, or the River of Death, as the Indians correctly named it years ago, usually rolls along at a height of twelve feet; but after the torrential rains of August, it suddenly assumed the proportions of a watery giant, with a dizzy height of 58 feet, spreading far beyond its banks and charging through dikes to cover 29,230 acres of splendid crops and 960 homes, and to drive 4,800 persons in four counties to higher land.

With the municipal water plant in Weldon submerged in filthy river water and the water intake for the municipal plant at Roanoke Rapids seriously damaged, with wells and pumps on all the farms in the watershed flooded, with privies bobbing around in the swirling river like bottles, with hundreds of refugees pouring into Weldon and other high points along the river, those of us in the local health departments in this area realized that we were in the midst of a disaster of the first order.

The Roanoke River rose at an amazingly rapid rate for three days, then held its crest for what seemed to be an endless period, and, finally, slowly receded to leave its filth and debris dumped at our doors. A foul stench hung like a pall over this area for several days following the flood, strongly reminding our olfactory nerves that the Health Department had work to do and plenty of it.

In looking back over our efforts during this emergency I find our activities were divided roughly into three phases: first, organization; second, procedures during the

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flood disaster; and third, rehabilitation and reconditioning procedures after the flood had receded.

In organizing the work our first major effort was the selection of quarters for the refugees, white and colored, who were pouring into several towns along the river. We joined forces with the local Red Cross Chapter, which, fortunately, was well organized and ready for action.

The schools, with their cafeterias and sanitary facilities, naturally answered best for the purpose of refugee camps. Rooms were cleared by W. P. A. workers, who were at our command through the splendid cooperation of our local supervisor, and all available cots were secured through efforts of the Boy Scouts, who also assisted us nobly in our hectic experiences with the Roanoke River. The cooks secured for these camps were for the most part already associated with the school cafeterias. Members of the Parent-Teacher Associations volunteered to assist in serving the refugees.

Helpers were selected from the refugees to assist in looking after the water supply, which had to be obtained from tank trucks and then boiled before being used for drinking or for cooking. These helpers also were charged with the responsibility of keeping the quarters clean and of running errands.

A public health nurse was placed in charge of each one hundred refugees, and was made directly responsible to the physician in charge and to the health department.

A physician was placed on call for each camp of not more than four hundred refugees, and for our largest camp of more than six hundred Negroes, a resident physician, Dr. Emmett Lupton, was secured. Dr. Lupton made an enviable record in his management of this large camp. In a camp of this size a resident physician is an absolute necessity, with at least two day nurses and two night nurses, the number of nurses, of course, depending on the condition of the refugees.

A sanitarian was made responsible for frequent inspections of the water supply, sanitary facilities, and general environment of each camp. With the municipal water supply out of operation it was necessary to keep large barrels of water in the toilets for flushing purposes. These toilets had to be supervised constantly to prevent a serious health hazard.

When the refugees were placed, we next joined with the city officials of Weldon in planning an emergency supply of drinking water. This was the most paradoxical problem we had. There was "water, water everywhere, but not a drop to drink." From the Highway Department we secured tank trucks, which were heavily dosed with H. T. H. before being filled with water from the municipal plant at Roanoke Rapids, five miles from Weldon. The officials at Fort Bragg furnished us a mobile filtering plant which supplied 144,000 gallons of filtered water every twenty-four hours.

The tank trucks distributed the water up and down the streets to citizens who were waiting with buckets and utensils of all shapes and sizes. Circulars were distributed in the flood area, warning everyone to boil water, regardless of the source, for ten minutes.

By this time we had ordered a large supply of triple typhoid vaccine, smallpox vaccine, diphtheria toxoid, and tetanus antitoxin, and were trying to locate sufficient quantities of chlorinated lime, H. T. H. or perchlorin. These products are usually stocked in small quantities in most communities, and efforts should be made at an early hour to secure an adequate supply.

It is wise also to order plenty of vaccine at the very beginning in any major disaster of this sort, since the public literally clamors for immunizations at this time. The total amount of typhoid vaccine ordered for the immunization clinics conducted by the health department and by private physicians was 2,900 10 cc. vials.

The next step in the organization phase was to determine as nearly as possible how many additional nurses and other personnel we needed to carry out our emergency program. In Halifax County we used twelve nurses. Four were from our own staff, three were Red Cross nurses, two were public health trainees from Chapel Hill, two were local nurses, and Dr. Cooper sent us Miss Beam from his department. We requested the State Health Department to have an engineer standing by to supervise the reconditioning of our water plant when the river receded. Mr. Jessup and Mr. Williams from the Division of Sanitary Engineering were on hand to assist in sanitation. Local physicians volunteered for service in the refugee camps, and the Junior Woman's Club fur-

nished us clerical assistance. A number of Boy Scouts were detailed to our department to run errands, distribute our circulars, and direct the public to our immunization clinics. The W. P. A. furnished us men who were placed under the supervision of Mr. Williams and our sanitarians.

Our courage and morale were maintained by almost constant contact with the State Health Department. We had hardly realized we were having a flood when Dr. Reynolds first wired us to advise him of our needs. Our biological preparations were furnished us promptly in large quantities, and experts were on hand to assist us at all times in the technical problems that were constantly arising.

With our personnel completed we worked out a daily schedule for the refugee camps and for the immunization clinics throughout the Roanoke River watershed. These clinics extended for a distance of thirty-five miles from the health department in Weldon. In addition to the immunization clinics conducted by the health department, the physicians at Roanoke Rapids had two clinics running simultaneously every day during the flood.

During this disaster we immunized 14,395 persons against typhoid fever and 200 children against diphtheria and smallpox. In the refugee camps everyone who had not been immunized against typhoid fever within the past two years was told that this vaccination had to be done. The refugees' meal tickets depended on whether or not they had been immunized. Prophylactic doses of quinine were given to all refugees daily to prevent a wave of malaria.

The nurse in charge of each group of refugees made thorough inspections of all refugees twice daily, and persons with any temperature or significant complaints were referred to the physician in charge for a further examination. Injuries that might need tetanus antitoxin were carefully watched for.

A sanitary inspector made a thorough inspection of each camp every few hours, in order to maintain as clean an environment as possible.

In Dr. Lupton's camp there were threatened abortions, cystitis, malaria and many other ailments, but not a single case of enteritis developed while he was there. All the babies were kept on evaporated milk feedings under Dr. Lupton's supervision.

It is important that all animals should be prohibited in refugee camps. A mad dog running wild among several hundred refugees would cause a general panic.

With the flooded river reluctantly receding, the rehabilitation phase of our program began.

Mr. McKimmon, from the Division of Sanitary Engineering of the State Health Department, was on hand by the time the water plant was clear of river water, advising the local authorities of the steps necessary to put the system into operation with a safe supply of water. Our experience in this flood proved that it is wise not to take any short cuts in putting the water system into operation, but to make certain the system is sterile before opening the mains for public consumption, even though the public howls for water.

After the whole plant had been cleaned and freed of its heavy coating of yellow ooze, the mains were filled with the water held in reserve in the city tank, carrying a chlorine content of 10 to 15 parts per million. This strength of chlorine was probably maintained in the mains for about forty-eight hours, although the dosage of chlorine was lowered at the plant immediately after the initial filling of the mains. The chlorine content of the water in the mains was then maintained at 1.5 parts per million for two weeks, when it was cut to 1 part per million. It was held between .7 and 1 part per million all winter, and was lowered to .5 parts per million the first of March. It is now at .4 parts per million, or within .1 of the usual chlorine concentration of water prepared with a rapid sand filter.

The public was allowed to use water from the mains a few hours after the original filling; however, we still insisted that it be boiled before being used for drinking until after we had obtained samples along the mains. This was a needless request, since the water was so strong with chlorine that it had to be boiled before people could get it close enough to their faces to drink it. Only two water samples were positive for B. coli; the third sample from this vicinity was negative.

Until the present time there has not been a single case of any disease in Weldon that

could have been caused by contaminated water.

One hundred W. P. A. workers were detailed to bury dead animals, clean up the filth and debris and to drain or oil impounded water.

As soon as we could get into the areas where the homes had been under water, instructions were issued for reconditioning these houses. The refugees were decentralized as soon as possible, in order to lessen the chances of herd diseases' developing. The floors and walls of these flooded houses were thoroughly scrubbed with hot, soapy water, to which was added about two and one-half teaspoonfuls of H. T. H. or seven teaspoonfuls of chlorinated lime per gallon. All furniture had to be cleaned with hot, soapy water. The instructions were distributed by Boy Scouts and sanitary inspectors. As far as possible, these homes were inspected by the health department before being reinhabited.

In the rural areas all the wells had to be sterilized before the water could be used. One-half pound of H. T. H. or perchlorin, or two pounds of chlorinated lime was mixed with water in a two-gallon pail. This was poured into the wells, allowed to stand for twenty-four hours, and then pumped off.

On every large farm a reliable person was selected to carry out these procedures after a demonstration had been given. The H. T. H. for this work was furnished by the Red Cross.

The privies that could be found were reset by W. P. A. workers, while a project to build three hundred new privies to replace those lost was instigated immediately following a detailed survey of the flooded area. This privy project was also financed by the Red Cross.

In the meantime, the immunizations were finished and the refugees were returned to their homes, while all of us who had been on duty practically day and night during this nerve racking experience "ceased firing" and hoped that, in the name of health, victory would be ours.

Summary

1. Schools with cafeterias, and with sewage facilities for men and women should be selected for refugee camps when available.

2. At least one public health nurse should be placed in charge of each one hundred refugees when sickness and injuries are at a minimum. This nurse should make inspections twice daily for temperature, signs and symptoms of contagious diseases, and for injuries.

3. A full-time resident physician is needed for a camp of more than four hundred refugees, and at least one physician should be placed on call for each smaller camp.

4. A sanitary inspector should be assigned to each camp.

5. An adequate supply of triple typhoid, diphtheria, and smallpox vaccine, as well as tetanus antitoxin, should be ordered at once, and immunizations against typhoid fever, diphtheria, and smallpox should be started immediately.

6. When the water supply is involved, all water should be boiled at least ten minutes before being used, and the State Health Department should be notified to have an engineer on hand to supervise the re-establishment of the water supply.

7. The local health department should immediately call on the State Health Department for a consultant to help maintain as healthy an environment as possible and to supervise the reconditioning program.

8. At least 100 pounds of H. T. H. should be on hand for every five hundred refugees involved. This should be obtained early through the Red Cross when possible, as the supply usually is very limited in any locality.

9. Each well should be sterilized with one-half pound of H. T. H., and all flooded homes sterilized with a solution made up of two and one-half teaspoonfuls of H. T. H. to each gallon of water.

We humbly pass the results of our experiences along to our fellow public health workers who also might find themselves engulfed in such a disaster at some time in the future, whether it be a flood, storm, fire or perhaps a war disaster.

Abstract of Discussion

Dr. H. G. Baity (Chapel Hill): Dr. Young's paper is so complete that I do not feel I can add anything of a technical nature. I think that this paper might well serve as a guide book to health agencies which may meet similar situations, and I strongly recommend that it be published and made available either through this organization or through the State Department of Health.

I should like to mention briefly the matter of planning an organization to meet a situation of this sort. We do not engage in planning to any great extent, and situations of this sort strike us unprepared. I had personal experience in disaster of a different sort several years ago which emphasized to me the chaos and loss of time that may result from lack of planning for disaster. In this situa-

tion much time was lost and a great deal of confusion resulted from nobody's knowing who was to be the responsible, directing agency. People were eager to lend their assistance, but there was no arrangement whereby those people and the various agencies could work together in a functioning organization.

All of us sooner or later, through disasters such as flood or fire or war, may meet situations such as Dr. Young spoke of; and it is not too early, even if war is the only emergency we think of, to prepare, in coordination with other interested agencies, at least an outline of what to do and how to do it in event of disaster. That necessarily must be skeleton in form, because the exact type of organization and procedure to be followed depends upon the nature of the cataclysm. If it is a local situation, then the local health department assumes leadership; if it is more than local, then the State Health Department takes over.

It is not too early for us to prepare for situations that may arise in the event of war. Let us make these plans today and stick them away, in case they may be needed. Then they will be very valuable.

Dr. C. N. Sisk (Waynesville): Dr. Young asked me to discuss this paper from the standpoint of floods in the mountains, in contrast with floods in the low country.

The only difference I can see between floods in the mountains and in the low country is the element of time. In the low country, when it rains a great deal, you realize that the streams are rising, and your radio and newspaper keep you informed. You have time to select refugee camps and make other preparations. In the mountains, the first realization that there is a flood may come when you are awakened during the night to find your house flooded and perhaps floating away.

On August 15, 1940, we had a flood in the mountains of western North Carolina which was said by the oldest citizens to be the greatest flood ever known. After we had cleaned up, we sat back, thinking that we had had an experience which no one else had ever had. On August 30, following two or three days of heavy rain, the heavens opened up at night again and the waters rose from three to ten feet higher than they did on August 15.

Our organization and plan of procedure following this flood were very similar to Dr. Young's. However, he was forewarned and was able to get his population into a camp. We did not have that warning. Furthermore, the mountain streams flow between the mountain ranges, and the one highway follows the stream. In the valley of the Tuckaseigee River, which runs through Jackson and Swain Counties for a distance of forty or fifty miles, every highway bridge and all minor bridges were washed away. One of our greatest difficulties was getting into the communities. If you were on one side of the river you could not get to the other side. The Highway Department and the W. P. A. went to work immediately to repair those bridges, and in a short time we were able to get into the communities. In this area, which was only a very small part of the flooded area in western North Carolina, sixty-seven homes were washed away. There were two hundred and fifty-one homes damaged, and the damage to roads and bridges was estimated by the Highway Department at $252,000. The damage to homes was estimated at $27,000. The damage to homes involved injury to many people. We mimeographed sheets of instructions received from the State Health Department and distributed them as rapidly as possible to all homes in the affected neighborhoods. Those sheets described how to recondition water supplies and food. The instructions called for the people to empty their springs and wells. I notice that Dr. Young did not mention emptying the wells. We asked the people to empty their wells, put in chlorine, and after twenty-four hours empty them again.

A great many people in this area can fruits and vegetables and store them in the cellars or in the houses. We insisted that these cans, either glass or tin, be immersed for twenty minutes in a chlorine solution. Many grocery stores were damaged. We recommended the destruction of vegetables that were edible without cooking. Our vaccination camps were organized just as Dr. Young's were, except that we went to the communities to do it. I noticed that his were centralized and wondered how he reached the people for the second and third doses, after they had scattered.

Dr. Young said that no typhoid fever or similar disease could be attributed to the flood in his section, and we in western North Carolina can say the same.

Dr. Young: In answer to Dr. Sisk's question about completing the immunization schedule, there the peculiar characteristic of our slowly receding flood came to our aid. We were able to give two injections of typhoid vaccine before the refugees were decentralized. Before we let them leave our camps we arranged for them to meet us at certain points throughout the Roanoke River watershed so that we could give them the third dose.

I wish to mention again the splendid cooperation that exists between the local health departments and our State Department. This was indelibly imprinted upon my mind during this flood.

I thank those who discussed this paper and thank you all for your attention.

INTRANASAL TUMORS

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The nasal passages and accessory sinuses are the site of more tumors than is any other part of the body except the cervix and uterus of the female. This area of secreting mucous membrane, closely attached to bone and cartilage, has a blood supply somewhat peculiar to itself, and is exposed to considerable irritation, changes of temperature, and trauma.

The ala nasi up to the anterior end of the inferior turbinate is lined with stratified squamous epithelium. The nasal passages and the sinuses, excepting the superior meatus, are lined with so-called respiratory epithelium—that is, columnar ciliated epithelium—, presenting varying degrees of thickness in different locations. For example, the epithelial lining of the sinuses is composed of low cells, almost cuboidal in type, while the turbinates are covered by very tall, columnar cells which may be more than one

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layer deep and give a pseudo-stratified appearance.

Tumors arising in this area present a diversity corresponding to the diversity of normal structures, and it is probable that the variations encountered in the malignances of the nose and sinuses are chiefly due to differences in ontogeny. However, metaplastic changes contribute a great deal to a variable morphology.

A typical squamous cell carcinoma arising from the squamous cells about the alae and anterior ends of the turbinates may show all the characteristics of skin cancer such as keratinization and cell nest formation. From the transitional epithelium over turbinates and nasal meatus, there may arise tumors greatly resembling the typical transitional celled carcinoma of the bladder. Arising from the cuboidal cells of the lining of the sinuses, there may be columnar-celled adenocarcinomas with the formation of well defined solid or cystic alveoli. Even the ciliated character of the normal cells may be reproduced in the malignancy.

There is no evidence that the neuro-epithelium (olfactory cells) of the superior meatus gives rise to neoplasms in the nose, but the supporting cells and the basal cells in this area can both give rise to tumors.

In addition to the tumors which arise from the nasal mucosa itself, the sinuses and nasal passages may be invaded by connective tissue—endothelial tumors and tumors of dentigerous origin. There are also rare tumors derived from the salivary glands.

Symptoms

Early symptoms are often extranasal. There may be ocular pain in the forehead and side of the face and temple, earache, toothache, deafness, tinnitus, diplopia, dysphagia, blindness, or hoarseness.

The most common local symptoms are:

1. Swelling of the cheek
2. Unilateral nasal obstruction
3. Epistaxis
4. Nasal discharge
5. Pain in the cheeks and teeth
6. Proptosis
7. "Gumboil"
8. Widening between the eyes.

Treatment

In discussing the treatment of such tumors, the scalpel must be omitted almost entirely.

Electrocoagulation, radium and x-ray are the implements with which to eliminate intranasal tumors. It must be remembered that with these three agencies there must also be a good pathologist, a good radiologist and a good surgically trained clinician for the proper treatment of cancer about the nose and sinuses.

The advantages of electrocoagulation are: (1) ease of operation, (2) lack of hemorrhage, (3) lack of pain and shock, (4) sealing off of lymph spaces. Objections to this method are: (1) that it may not catch outlying cells; (2) that it sacrifices some healthy tissue; (3) that the cosmetic effect may be poor; (4) that there is some operative risk; (5) that the major blood vessels may be injured.

The advantages of irradiation are: (1) that it is not frightening to patients; (2) that it leaves good cosmetic result; (3) that it catches outlying strands and metastases in adjoining glands. Objections to irradiation are: (1) that, insufficiently screened, it may give burns, periostitis, perichondritis and other painful reactions; (2) that inadequate irradiation may stimulate cancer cells, or seal them in scar tissue; (3) that it makes cancer resistant to further treatment.

Fortunately x-ray and radium work best on the tumors which are not successfully treated by electrosurgery.

There are some established facts concerning the effect of different types of treatment which are of considerable help in deciding the treatment of choice in a given case.

1. Location of tumors is an important factor in determining what method of treatment shall be used. Favorable sites for electrosurgery are the face, ear, nose, lips, alveolar ridge, maxillary sinus, palate, epiglottis and anterior part of the tongue.

2. Pedunculated tumors are good cases for electrosurgery. A fissured sessile tumor at the base of the tongue or on the pharynx should be treated by irradiation; history of a very rapid growth would be in favor of irradiation.

3. It was early known that the embryonal types of tumors were radiosensitive. Differences in the age of Drosophilia eggs make a difference in the sensitivity.

4. Tumors are likely to be more radiosensitive in young patients. less sensitive in old, anemic patients.

5. Infection retards sensitivity.
6. Bulky tumors are resistant after infarction and liquefaction.
7. Metastases often undergo metaplasia and are more resistant than the original tumor.
8. Glandular carcinomas containing much mucin are resistant.
9. First irradiation is most effective. Tumors are much more resistant after the initial course of treatment.
10. Rapid early regression may lead to inadequate treatment.
11. Ligation or impairment of blood supply reduces the effect of irradiation.

Types of Tumors

Time will not permit a detailed discussion of all the tumors that attack the nose and sinuses. However, I should like to discuss in greater detail some of the more common intranasal tumors.

Polyp: The most common of all of the nasal tumors is the nasal polyp. This tumor is classified as a fibroma histologically. Under the microscope these tumors show sparsely arranged connective tissue cells, but are infiltrated with all sorts of wandering cells, including eosinophils and mast cells. Some of these fibromas are soft and loose and are called polyps; others are very dense and hard, and are usually classified as fibromas. When the intercellular fibers are little developed and the tumor is made up of closely packed cells, the growth may be rapid and invasive, and the tumor should really be called a sarcoma.

Clinically, polyps must be divided into two types—the allergic and the infectious. The allergic type of polyp is practically always bilateral and is accompanied by a pale mucosa and by an eosinophilia. The infectious type may or may not be unilateral. It is usually accompanied by pus and a red mucous membrane. Many cases have a combination of allergy and infection. In allergic cases the allergy should be treated first and the infection, if present, treated second. The mixed type may require surgery, which should be radical and complete and followed with some irradiation. Certain allergic types of polyps not so far advanced may be helped by irradiation alone. The infectious types are of course surgical and should be treated as a chronic purulent sinusitis.

Osteoma: Osteoma is a bony tumor which also attacks the sinuses. It must be remembered that an osteoma is an encapsulated bony tumor growing out from a given point and that it must be differentiated from an exostosis, which is a hyperplastic bony growth of diffuse nature probably due to some inflammatory process in the periosteum. There are three different types of osteomas: the hard, eburnated; the spongy or cancellous; and the mixed type, which has a hard periphery and a spongy center. They are usually rather easily diagnosed by x-ray, and are most common in the frontal sinus. The treatment is entirely surgical, but it must be remembered that the pedicle from which the tumor arises must be destroyed.

Mixed Cell Tumor: Mixed cell tumors are occasionally found in the sinuses, particularly in the maxillary. They are tumors of the salivary gland type, but are aberrant—that is, they are not directly associated with the salivary glands. They may also occur in the retropharynx, lateral pharyngeal wall, cheeks, base of the tongue or palate. They occur in all ages. These tumors are potentially malignant and require a long observation period after their removal. In many cases their growth is slow. Like a great many other tumors, they are more likely to be malignant when they recur. Tumors that have been undisturbed rarely invade the lymph spaces, but after unsuccessful removal they frequently invade the cervical glands. Surgical removal by electrocoagulation is definitely the treatment of choice, since these tumors do not respond to irradiation unless the cells are of the glandular type.

Giant Cell Tumor or Epulis: These tumors arise from parts of bone which have been formed by cartilage. Since this is true, bones formed from membrane should be immune to this particular tumor. Bloodgood regards them as benign tumors, but all writers do not agree. As for treatment, Bloodgood, Geschicter and others advise surgery; Ewing, Pfahler and others advise irradiation.

Fibro-Epithelial Tumor or Papilloma: There is much confusion about the classification of fibro-epithelial tumors or papillomas. This is probably because they are quite rare. They are usually regarded as benign growths which may be multiple or single and are rarely found anywhere except on the anterior portion of the septum; however, they may also be found on the middle

turbinate, in the ethmoid region, and even inside the sinuses.

The diagnosis cannot be made macroscopically because these tumors may have the appearance of a carcinoma in cases where tissue destruction has taken place. The prognosis is good if the tumor is in the anterior part of the nose where complete removal by cautery can be done. These tumors will recur if removed by snare or punch, and they must always be regarded seriously, since we can never prove that they will not finally become malignant. The ideal treatment is removal by electrocoagulation; however, they are fairly sensitive to x-ray and radium. If the sinus is involved, both radical surgery and x-ray are indicated.

Cavernous Hemangio-Endothelioma: This is a rare tumor which usually arises from the ethmoid region and does not metastasize. However, it is an extremely dangerous tumor because of its vascular structure and its tendency to destroy by infiltration. It may fill the entire nose and invade the sinus, eroding the walls. The symptoms are usually nasal obstruction, profuse epistaxis, and later, nasal disfigurement.

The tumor is usually soft, lobulated and dark purple. It must be differentiated from cavernous hemangioma, which is not a real tumor. The hemangio-endothelioma arises from blood vessel walls and should be regarded as a genuine tumor of this structure. Again, the ideal treatment is removal by electrocoagulation; however, hemorrhage is a problem with this method. Irradiation is effective in reducing the size of the tumor, at least, and has the advantage of producing no hemorrhage.

Adamantinoma: Adamantinoma originates from the paradental epithelial debris, while an odontoma or dentigerous cyst is a real teratoma arising from the dental follicle and is characterized by an embryonic tooth in its walls. This tumor is slow growing and distends the tissues until they are parchment-like around the tumor. It occurs chiefly in adults and frequently follows tooth extraction. Ewing says this tumor is more apt to be solid in the upper jaw and also more likely to be malignant in this location. This tumor is difficult to remove in its entirety, and I believe it is seldom cured. Surgical removal with electrocoagulation is the treatment of choice.

Basaloma or Cylindroma: The basaloma or cylindroma is also called endothelioma and basal cell carcinoma. These tumors are comparable to the basal cell growths arising from the skin, except that those of the mucosa are usually adenoid or cystic in type, while those of the skin are solid. Grossly they are fleshy, sessile and firm. They may have the appearance of a fleshy polyp, and they bleed easily. They advance rapidly by extension, but do not metastasize. This tumor is radiosensitive, but has a marked tendency to recur after removal. The best method of treatment is radical resection and irradiation if the tumor is within a sinus, but if it is exposed, irradiation alone is probably the treatment of choice.

Carcinoma: Most of the carcinomas of the nose and sinus are more or less sensitive to irradiation. Tumors of this class which are definitely radiosensitive are lympho-epitheliomas, transitional cell types, basal cell carcinomas and glandular carcinomas without mucin. Tumors that are more radioresistant are mature cell squamous epithelial types, epidermoid carcinomas in the ethmoid area, glandular types containing much mucin, and melanomas.

Sarcoma: Lymphosarcomas and allied small round cell types are very sensitive to irradiation. The fibrous types, such as the spindle cell and the osteo and chondrosarcomas, are much less sensitive. The last two tumors mentioned are not as violently malignant as the ones mentioned above and may be treated with electrocoagulation, when they can be reached.

There are other rare tumors of the nose, such as chordomas, plasma cell tumors of the nose, and lympho-epitheliomas, which will not be discussed in detail in this paper.

303 Hume Mansur Building.

The Ulcer Patient.—Today, attention is focused more largely on the person who has the ulcer than on his stomach or duodenum: on his heredity, his physical, mental and emotional make-up, the nature of his endocrine and autonomic nervous system equipment, his social status and his personal habits of life. The thin, lantern-jawed, hungry-looking person with a nervous, introspective and sensitive temperament is the one likeliest to develop peptic ulcer.—T. Grier Miller: The Management of the Complications of Peptic Ulcer, New England J. Med. 224:401 (March 6) 1941.

Alkaline Medication in Bleeding Ulcers.—I doubt the necessity of alkaline medication in bleeding ulcers and suspect that often it is a factor in the disturbed chemical condition of the patient. Our patients have seemed to do equally well without any such medication.—T. Grier Miller: The Management of the Complications of Peptic Ulcer, New England J. Med. 224:403 (March 6) 1941.

RECURRENT UROLITHIASIS

G. AUBREY HAWES, M. D.

CHARLOTTE

Since the advent of x-ray and the modern urological instruments, urinary calculi may be diagnosed early and surgical removal accomplished before irreparable renal destruction has resulted. At the present time one of the major problems confronting urologists is the recurrent formation of calculi following operation, and in view of the frequency of recurrence, the surgical procedure must be considered as only one phase in the management of cases of urinary lithiasis. The literature on the subject of calculous disease of the urinary tract is voluminous; however, only comparatively recently has the problem of recurrent lithiasis received the consideration it deserves. Patients with urinary calculi who present themselves for surgery should be informed as to the average percentage of recurrence, and should be urged to insist on close urological supervision for an indefinite period after operation in order to prevent recurrence. The major reasons for surgical removal of a urinary calculus are to relieve the patient of pain and to prevent renal destruction. In the light of our present knowledge, if a patient is permitted to return to his usual habits of living without intelligent aftercare in order to prevent a recurrence, then the urological surgeon is certainly taking an unnecessary responsibility upon his shoulders.

In considering this subject, one should bear in mind the possibility of a pseudo-recurrence, caused by a fragment of stone not removed at operation. In order not to confuse these two conditions, it is necessary to take a postoperative roentgenogram to be sure that no fragment has been left.

In 1915 Cabot and Crabtree[1] reported a recurrence of stone in 56 per cent of cases in which nephrotomy was performed and in 51 per cent of those in which pyelotomy was used at the Massachusetts General Hospital. Seven years later, Barney[2] reported a recurrence of 32 per cent at the same hospital; and it is interesting to note that 45 per cent of the recurrences were demonstrated by roentgenograms to be pseudo-recurrences. In 1924 Braasch and Foulds[3] reviewed 819 cases of urolithiasis, and reported recurrences in 10.48 per cent. In 685 cases subjected to surgery 31, or 4.5 per cent, had positive x-ray shadows of stone immediately after operation (pseudo-recurrence). Brongersma reported a recurrence of 23.6 per cent following pyelotomy and 35.4 per cent following nephrotomy. Hunner[4] in 1927 reported recurrences in 9.5 per cent of cases following operations for renal calculi, and 4.4 per cent following surgical removal of ureteral calculi. In 1931 Herbst[5] reported a 15 per cent recurrence of stones following operations. Twinem[6], in 1937, carefully reviewed 56 postoperative calculous cases which had been followed for one and one-half years in the Brady Urological Foundation. Excluding pseudo-recurrences, there were only 3 recurrences (5.36 per cent). He believes, as do many urologists, that making x-ray films while the patient is still on the operating table, after all the stones have presumably been removed, is a most valuable procedure, especially in cases with multiple stones or large branched calculi. Twinem's report showed a higher percentage of recurrence following operations for multiple calculi than after operations for single stones; conversely, Braasch and Foulds found a higher percentage of recurrence in cases with a single calculus. Fifteen patients in Twinem's series had staghorn calculi removed; 6 of these, or 40 per cent, had recurrences. He does not state whether any of these patients with staghorn calculi had early postoperative roentgenograms. A report on this would have been both interesting and instructive, for all urologists realize how difficult it usually is to remove this type of calculus without breaking off one or more infundibular branches. Twinem points out that many writers refer to a stone-forming diathesis, or a type of metabolism favoring calculus formation; but apparently a local factor is also required, as recurrence is infrequent in the opposite kidney or in the kid-

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1. Cabot, H. and Crabtree, E. G.: Frequency of Recurrence of Stone in the Kidney after Operation, Surg., Gynec. and Obst. 21:223-225 (August) 1915.
2. Barney, J. D.: Question of Recurrent Renal Calculi, Surg., Gynec. and Obst. 35:743-748 (December) 1922.
3. Braasch, W. F. and Foulds, G. S.: Post-Operative Results of Nephrolithiasis, J. Urol. 11:525-537 (December) 1923.
4. Hunner, G. L.: Calculus of Upper Urinary Tract Treated by New Methods; End Results, Tr. South. S. A. 40: 1-17, 1927.
5. Herbst, R. H.: Recurrent Renal Calculus; Its Cause and Prevention, Am. J. Surg. 12:58-62 (April) 1931.
6. Twinem, F. P.: Study of Recurrence Following Operation for Nephrolithiasis, J. Urol. 37:259-267 (February) 1937.

ney which drains well after operation and is not infected. Charlie Higgins[7] in 1938 stated that in the Cleveland Clinic prior to the year 1932 the incidence of recurrences was 16.2 per cent; from 1932 until 1937 the incidence had been reduced to 4.6 per cent. This marked reduction was ascribed to the fact that the high vitamin A, acid or alkaline ash diet had been added to the other postoperative measures, thereby controlling the hydrogen ion concentration of the urine.

Higgins[7a] noted in reviewing 100 cases of recurrent lithiasis that during the first three years after operation recurrences had developed in 57 per cent. He believes that diligent postoperative care immediately following operation is imperative; and that, after the three year period, there is a marked diminution of the incidence of recurrence. In this series the staphylococcus albus was the predominant organism producing renal infections, while the proteus organism was second in frequency. He noted that recurrence was more common in patients in whom the *p*H of the urine could not be successfully controlled. It should be stressed that the *p*H of the bladder urine is not a true indication of the *p*H of each renal pelvic specimen. Time and again in the Brady Urological Foundation I have seen postoperative calculus patients with a *p*H of 6.0 of the bladder urine, while the normal or unoperated kidney excreted a urine with a *p*H of 4.5, and the operated kidney excreted urine with a *p*H of 7.5. This fact should be constantly borne in mind in our postoperative treatment. Of course the most common reason for a persistently alkaline urine is infection, and the proteus organism is the one most resistant to treatment. When sulfanilamide and its associated compounds were first used for the treatment of proteus infections of the urinary tract the results were very promising, but gradually we have realized that these drugs are not entirely effective in eradicating this organism. Lowsley, Kirwin, Higgins, and many others are of the opinion that when we have a method of successfully combatting proteus organisms the recurrence of renal calculi will be reduced to a minimum. Spence and Baird[8] in 1939 reported 164 cases of renal and ureteral calculi and noted a 38.4 per cent recurrence in 86 cases of renal stones and 18 per cent recurrence in 78 cases of ureteral stones.

A review of this subject in several competent and well known textbooks of urology was most interesting, because of the dearth of material. Hinnman[9] states: "A diet rich in vitamins (A, particularly, as in cod and halibut liver oil) is indicated in the patient from whom stones have been removed. A diet which will keep the urine well on the acid side may be helpful for all but cystin stones. However, the regular free ingestion of water (a glassful every one to two hours while awake) will be the best means of prevention during the stone-forming period." Cabot[10] summarizes several reports on the incidence of recurrence, but gives no suggestions as to the prevention of recurrent stone formation. Young[11] does not discuss the prevention of recurrent urinary calculi in his textbook.

Etiology

At the present time there has been demonstrated no single etiological factor producing renal calculi; therefore, we are compelled to make a careful study of various conditions which have been shown by animal experimentation and clinical observations to have a part in the formation of urinary stones. Of course the factors which produce the original calculus may be responsible for a recurrent calculus; however, other etiological agents producing lithiasis may be introduced during the operation for a primary calculus or during the postoperative period.

Infection: For the past forty years, the relationship between urolithiasis and infection has been stressed. In 1895 Bartlett was of the opinion that infection plus stagnation was the major factor in the formation of calculi. Higgins has recently stated that much attention during the past few years has been directed to the power of the proteus organism to split urea, with the formation of carbon dioxide and ammonia; yet Brown and Earlam found that 40 per cent of Staphylococcus albus and 18 per cent of bacilli infecting the urinary tract possess a similar property. Nevertheless, it has been the experience of the Brady Urological

7. (a) Higgins, C. C.: Recurrent Renal Lithiasis, Review of 100 Cases, J. Urol. 40:184-192 (July) 1938.
(b) Higgins, C. C.: Recurrent Renal Lithiasis, Cleveland Clin. Quart. 6:18-28 (January) 1939.

8. Spence, H. M., and Baird, S. S.: Recurrent Renal and Ureteral Calculi, Management and Prevention, Am. J. Surg. 44:848-857 (May) 1939.

9. Hinnman, Frank: Principles and Practice of Urology, Philadelphia, W. B. Saunders Co., 1936.

10. Cabot, Hugh: Modern Urology, Philadelphia, Lea and Febiger, 1936.

11. Young, H. H.: Practice of Urology, Baltimore, Williams and Wilkins Co., 1927.

Foundation and, I am sure, of many other clinics, that the proteus infections are the most difficult to control. The large amount of ropy, stringy, mucous material which this organism produces plays a major part in obstruction and stagnation. Even though a certain percentage of staphylococci and bacilli possess this urea-splitting property, it is rare to have as much renal destruction result from infection with these organisms as from infection with proteus organisms. John Hellstrom[12] in 1938 stated: "For the past 15 years I have been specially interested in the importance of staphylococci in the formation of stones; and, I have come to the conclusion that the staphylococci are the most important cause of the occurrence of calculi with infections of the urinary passages." In a review of 100 cases of stones, Hellstrom found that 75 per cent were caused by staphylococci. He analyzed these stones by dissolving the calcium salts with dilute hydrochloric acid, which left a varying amount of organic material; this material when smeared on a slide and stained by the Gram method was found to consist mainly of staphylococci, the majority Gram-negative but some Gram-positive, and others transitional. In several cases Staph. albus, presenting the same properties as the staphylococci in the urine, was cultivated from the nucleus of the stones; and he concluded that the origin of stone formation was intimately associated with the staphylococcuria. Furthermore, in cases with sterile urine, examination of the organic material showed that the stone formation was infectious and not aseptic. Again, Hellstrom described the extirpated kidneys or other operative specimens in his series of staphylococcic stones as showing the presence of chronic pyelitis and ureteritis (round cell infiltration in the mucous membrane of the renal pelvis and ureter), but very slight parenchymal lesions. The few cases of severe pyelonephritic lesions were thought to be the result of a secondary infection with bacilli. On the contrary, most urologists are of the opinion that staphylococcus infections are the most common cause of purulent processes in kidneys or other organs. Hellstrom's findings of pronounced inflammatory changes in the minor calyces, with desquamated epithelium and with calcium salts encrusting the mucosa, agree with Randall's description in 1936. In preventing recurrences, Hellstrom believes that intravenous neosalvarsan, proper urinary antiseptics, free urinary drainage, renal pelvic lavages, removal of foci of infection, and large doses of vitamin A as suggested by Higgins are the most effective methods at our disposal. In spite of these measures, he had 19 true recurrences, or 19 per cent, after operation, and over half of these recurrences appeared within the first year after operation. He concludes that, instead of surgical trauma, disturbances in metabolism, hyperparathyroidism, or lack of vitamins, it is the persistent or recurrent staphylococcic infection which is the most important cause of stone recurrence, and that this fact is due to the capacity of these organisms to split urea, causing formation of ammonia and a favorable reaction for the precipitation of alkali salts.

Physicochemical Mechanisms: Experimental methods under this heading come under two groups: (1) excessive excretion of oxamide, calcium oxalate, or calcium carbonate produced by ingestion of large quantities of these materials; (2) encrustation or impregnation of the urinary epithelium by crystalline matter, which is accomplished by urea-splitting organisms. The physicochemical principle explaining the formation of renal stones is that colloids form a gel in the renal pelvis, and simultaneously there occurs a precipitation of crystalline matter, which diffuses through this forming gel, resulting in a coalescence of the crystals, and thereby producing concrement formation. Keyser[13], who supports this theory, is of the opinion that the form which the stone assumes is dependent on the set of the colloidal gel and on whether the crystallization begins from the center or from the periphery. Approximately thirty years ago Lichtwitz and Schade demonstrated that crystalloids (water insoluble) are kept in a state of dispersion in the urine by absorption to irreversible urinary protective colloids.

In experimental animals Keyser[14] demonstrated that hyperexcretion of calcium oxalate produced a precipitation of octahedral, dumb-bell crystals, but that by further in-

12. Hellstrom, John: Significance of Staphylococci in the Development and Treatment of Renal and Ureteral Stones, Brit. J. Urol. 10:348-372 (December) 1938.

13. Keyser, L. D.: Newer Concepts of Stone in the Urinary Tract, J. Urol. 42:420-435 (September) 1939.

14. Keyser, L. D.: Recurrent Urolithiasis: Etiologic Factors and Clinical Management, J. A. M. A. 104:1299-1306 (April 18) 1935.

tensification of oxalate excretion there resulted a precipitation of fusing clusters of spheroidal crystals which formed concrements of calcium oxalate. The *p*H of the urine is an important factor in maintaining crystalloids and colloids in solution, and quite frequently determines the composition of the concrement. Amorphous and triple phosphates and carbonates are usually precipitated in alkaline urines, while the urates, oxalates, and crystalline phosphates are precipitated from acid urines. This fact explains the rationale of changing the *p*H of the urine by appropriate medication to the reverse of that in which the calculus formed. Some observers, particularly Butterfield[15], believe that all stone forming individuals should have their urines kept distinctly acid, in view of the fact that alkalinity favors infection and infection favors stone formation. By and large, one may conclude that physicochemical mechanisms do play an important part in the formation of crystalline stones, but, unquestionably, there are other factors in the etiology of recurrent urolithiasis.

Urinary Stasis: We are aware of the fact that stasis tends to render urine alkaline, which in turn favors infection and also encourages precipitation of salts. In many cases of recurrent calculi ureteral strictures, ureteral kinks, or extra-ureteral fibrous bands or aberrant vessels may be found. In cases of this type, serial pyelograms and excretory urography are invaluable in demonstrating either pre or postoperative lesions producing stasis. These factors may then be corrected by appropriate procedures. In a recent article on serial pyelograms[16] I stressed the importance of this procedure in any type of hydronephrosis resulting from calculi, infection, aberrant bands or vessels, and neuromuscular dysfunction. Henline[17], Moore[18], Bray, Hawes and others are of the opinion that serial pyelograms give a more concise and accurate indication of urostasis than do excretory or intravenous urograms. Apparently urinary obstruction plus infection produces more recurrent stones than do all the other etiological factors combined.

Foci of Infection: In 1921 Rosenow and Meisser[19] conducted a series of experiments establishing the relationship of streptococci and calculus formation. From 6 dogs the pulps of teeth were removed and streptococci which had been repeatedly isolated from the urine of a patient with typical attacks of renal colic due to stones were placed in the pulp chambers. These teeth were then sealed with impervious dental cement. The duration of the experiment ranged from eleven to one hundred and twenty-three days. Five of the 6 dogs developed calculi; the sixth dog died a few days after the experiment was undertaken. In four of the dogs there were bilateral calculi varying from small concretions to stones measuring 3 x 7 mm. and with a chemical composition similar to that of stones in human beings. These investigators were of the opinion that their experiments established the causal relationship between calculi and streptococci inoculated into an animal's teeth. In view of these findings, it behooves us to make a diligent search for foci of infection, such as the teeth, tonsils, prostate, cervix and colon, in all patients with urolithiasis. In a study of 100 cases of recurrent urolithiasis, Higgins found foci of infection in the prostate in 27 per cent, in the teeth in 11 per cent, in tonsils in 16 per cent, and in sinuses in 3 per cent. When such foci of infection are found they should be eradicated after removal of the calculus.

Metabolic Disorders

Hyperparathyroidism: In 1934 Chute[20] reported a case of hyperparathyroidism with a stone in a solitary kidney, and referred to 16 other cases which had been seen in the Massachusetts General Hospital. Albright and Bloomberg[21] in 1934 reported 23 cases of hyperparathyroidism and renal disease, proven by operation, from the same hospital; they are of the opinion that stone formation in such cases belongs to that etiological group where the predisposing ab-

15. Butterfield, P. M.: Personal communication.

16. Hawes, G. A.: Serial Pyelograms in Nephroptosis (Read before New York State Urological Association, April 26, 1939) North Carolina M. J. 40:222-230 (May) 1941.

17. Henline, R. B. and Bray, J. L.: Value of Serial Pyelograms in Hydronephrosis and Nephroptosis, J. Urol. 38: 620-633 (December) 1937.

18. (a) Moore, T. D.: Value of Serial Pyelograph in Diagnosis, J. Urol. 28:437-454 (October) 1932.
(b) Moore, T. D.: Consideration of Ureter in Serial Pyelograms, South. M. J. 27:825-833 (October) 1934.
(c) Moore, T. D.: Limitations of Intravenous Urography, South. M. J. 29:242-248 (March) 1936.

19. Rosenow, E. C. and Meisser, J. G.: Nephritis and Urinary Calculi Following the Experimental Production of Chronic Foci of Infection, Preliminary Report, Collected Papers Mayo Clin. 13:253-256, 1921.

20. Chute, R.: Vital Importance of Relation of Hyperparathyroidism to Formation of Certain Urinary Calculi—and Its Remedy, New England J. Med. 210:1251-1253 (June 14) 1934.

21. Albright, F. and Bloomberg: Hyperparathyroidism and Renal Disease, Tr. Am. A. Genito-Urin. Surgeons 27:195-202, 1934.

normal factor is an excess of crystalloids in the urine. Albright, Baird, Cope, and Bloomberg[22] have also emphasized the relationship between hyperparathyroidism and the formation of renal calculi. Higgins reviewed 375 cases of renal concrements and found only one instance of hyperparathyroidism. Until July, 1939, there had been no cases of renal stones associated with hyperparathyroidism recognized in the Brady Urological Foundation. With this possible etiological factor in stone formation, we should routinely determine the calcium and phosphorus content of the blood plus the excretion of calcium in the urine of all cases of urolithiasis.

Vitamin A Deficiency: Today many drug firms are compelling both the physicians and the laity to become vitamin conscious. Higgins has stressed the importance of an adequate amount of vitamin A in the postoperative care of calculous cases. It has been shown by Steiner, Zuger, and Kramer[23] that vitamin A deficiency causes hyperplasia, then metaplasia and finally atrophy of the pelvic and ureteral mucosa; and that large plaques of desquamated epithelium form nuclei for the development of calculi, even when no gross or microscopic evidence of urinary tract infection exists. Higgins believes a biophotometer test, by a competent ophthalmologist, should be done on every patient with renal lithiasis, because of erroneous deductions from a dietary history. However, recently Steininger and Roberts[24] have compared biophotometer tests of 100 children from the University Laboratory school and 160 children from poor sections of Chicago and concluded that this test is not, at present, accurate enough as a means of diagnosing subclinical vitamin A deficiency.

Nevertheless, in view of the presumptive clinical and experimental evidence of the relationship between vitamin A deficiency and the formation of renal calculi, I am thoroughly convinced that all patients with urinary concrement should be given vitamin A regularly for at least three years after removal of the stone.

Cystinuria and Oxaluria: The occurrence of cystin stones has been recognized well over one hundred years, and in 1916 Kretschmer[25] collected 107 cases of cystin concrements. Cystin is an amino acid, necessary for the maintenance of growth and soluble in alkaline solutions. In normal metabolism it is converted into urea and inorganic sulfate, which is excreted in the urine. However, in certain individuals there exists a faulty metabolism of cystin so that only part of the cystin is converted into sulfate, while the excess cystin is excreted in the urine, thereby producing cystinuria. If, in these cases, there is a sufficient excess of cystin crystals, a cluster of these crystals may coalesce to form a cystin stone. It is the general opinion among urologists that a marked alkaline urine prevents the precipitation of these crystals in the urine. Some observers have reported dissolution of cystin calculi by intense alkalinization of the patient. There seems to be a definite hereditary factor in cystinuria, which should be investigated in patients with cystin calculi. It should be mentioned that many articles on cystin stones stress the fact that frequently these stones are non-opaque to x-ray. However, with improved x-ray apparatus and technique, probably most of these calculi can be demonstrated roentgenographically. Robert McKay[26] in 1936 called our attention to the possibility that in some cases reported as cystin calculi, the stones may not have been composed entirely of the pure chemical, thereby explaining the decreased density.

Oxaluria is not infrequently associated with an excessive intake of food with a high oxalic acid content, which produces an increased elimination of oxalates in the urine. Oxalic acid stones usually have a varying amount of calcium in them, so that these calculi are usually referred to as calcium oxalate stones. Almost invariably this type of stone is formed in an acid urine. This fact is quite important in the postoperative care, and the urine should be maintained at a *p*H of 7.0 or neutral. If the urine of such patients is shifted to the alkaline side, infection is favored and an alkaline calculus may be the recurrent type of stone. Ne-

22. Albright, F.; Baird, P. C.; Cope, O. and Bloomberg, E.: Studies on the Physiology of the Parathyroid Glands; 6. Renal Complications of Hyperparathyroidism, Am. J. M. Sc. 187:49-65 (January) 1934.

23. Steiner, M., Zuger, B. and Kramer, B.: Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A, Arch. Path. 27:104-114 (January) 1939.

24. Steininger, G. and Roberts, L. J.: Biophotometer Test as Index of Nutritional Status of Vitamin A, Arch. Int. Med. 64:1170-1186 (December) 1939.

25. Kretschmer, H. L.: Xanthin Calculi, Report of a Case and Review of the Literature, J. Urol. 38:183-193 (August) 1937.

26. McKay, R. W.: Cystin Stones, South. Med. and Surg. 98: 367-370 (July) 1936.

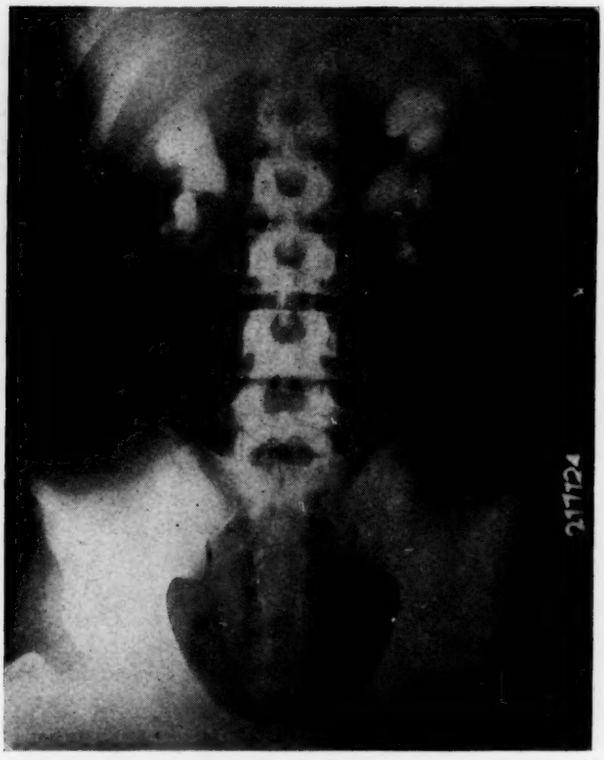

Fig. 1. A flat plate of an 18 year old Jewish male complaining of cloudy urine. Urinalysis showed many cystin crystals. After removal of the stones from the left kidney, the chemical analysis showed pure cystin.

ville[27] in 1936 published an article in which he stated his opinion that vitamin B deficiency and oxaluria were associated. However, up to the present time this concept has not been stressed by urologists in general.

Uric Acid and Xanthine: These products are the end result of the metabolism of nucleic acid, which is produced by the ingestion of purine substances (liver, brain, sweetbreads, kidney, mushrooms, etc.). Uric acid stones are much more common than xanthine calculi, possibly because uric acid is only a further oxidation product of xanthine. Kretschmer[25] in 1937 reviewed the literature and collected 15 cases of xanthine calculi, to which he added his case. From 0.4 to 1 Gm. of uric acid is excreted in the urine of the average individual daily. When there is an excess ingestion of purine substances, there results an excess excretion of uric acid in the urine, which favors the formation of uric acid stones.

Phosphaturia: The presence of phosphates in an alkaline urine is not an uncommon finding, and this factor alone is not sufficient for the production of concrements. However, when there also exists a urea-splitting renal infection, which produces a strongly alkaline urine, then these factors are frequently associated with recurrent urolithiasis. Snapper has suggested that phosphaturia may be clinically eradicated by administering 2 Gm. of sodium benzoate three times a day, and that this may be important in preventing recurrent calculi in patients with urea-splitting infections.

Trauma: The time to begin the program for prevention of recurrence is at the operating table. Unnecessary handling and rough manipulation of the kidney is to be condemned. If one is dealing with calculi of the renal pelvis, the posterior aspect of the pelvis can be exposed by intelligent retraction and the calculus delivered through a posterior pyelotomy. There is one point which should be stressed in performing pyelotomy: the uretero-pelvic junction should be avoided in making the pyelotomy incision, for this is the most favorable site for a postoperative stricture to develop, with resultant urinary stasis. Usually when there is only a low grade renal infection, the muscle layers of the pyelotomy incision are closed with 0000 chromic catgut sutures on an atraumatic needle. The pelvic mucosa is never sutured, lest encrustation or precipitation of calcium on the suture might form a nucleus for a recurrent stone. When pronounced renal infection is present nephrostomy is the procedure of choice in order that free drainage may be established. Since the advent of ribbon gut, nephrostomy has been used more frequently because hemorrhage can be controlled and there is less destruction of parenchymal tissue. When the pelvis is intrarenal or inaccessible at the time of operation, it is usually best to remove the calculus by nephrolithotomy and establish adequate urinary drainage.

Twinem has pointed out the advisability of performing a calycealectomy when dealing with a poorly draining dependent calyx where the calculus apparently originated. This is easily accomplished by sharp dissection of a wedge-shaped portion of renal tissue overlying the diseased calyx, and removal of the calyx by a small bone rongeur. A nephrostomy tube is inserted in the renal pelvis, a piece of fat placed in the kidney wound for hemostasis, and the true renal capsule approximated with ribbon gut.

27. Neville, D. W.: Constitutional Factor in Oxaluria, Urol. and Cutan. Rev. 39:32-33 (January) 1935.

In cases of staghorn calculi with renal infection and diminution of function, the financial status of the patient should be considered in determining the best method of management. In patients who can afford repeated hospitalization if necessary, a wide nephrolithotomy and nephrostomy may be employed, in spite of the frequency of recurrence (40 per cent in Twinem's series). With patients in the lower income bracket it is probably advisable to perform a nephrectomy, so that they may return to their work as soon as possible.

Summary of Postoperative Care

It is quite important to begin the prevention of recurrences at the operating table. Unnecessary handling of the kidney is to be condemned. After the operation the following specific measures should be instituted:

1. The general physical condition of the patient should be maintained at the highest level. Blood counts should be made frequently, and the hemoglobin kept above 90 per cent.

2. Extra-urinary foci of infection should be eradicated.

3. Careful analysis of the removed calculus should be made, so that the patient may be placed on a proper diet.

4. If hyperparathyroidism is demonstrated, removal of the tumor is definitely indicated.

5. Immediate postoperative roentgenograms should be made to exclude pseudo-recurrences.

6. Frequent bacteriological studies of the urine from both kidneys should be done, and urinary infections combatted. The use of the ketogenic diet, methenamine, mandelic acid, sulfanilamide and its related compounds, and neosalvarsan depends on cultural identification of the offending organism.

7. Intermittent ureteral dilatation and renal pelvic lavage should be done to insure free urinary drainage. Occasionally surgical drainage of the involved kidney is necessary.

8. Vitamin A should be administered.

9. Patients with alkaline stones should be kept on a Higgins high vitamin A acid ash diet. The urinary *p*H of the involved kidney should be maintained below 5.2, by diet, ammonium chloride or dilute hydrochloric acid. With calcium oxalate stones a low oxalate diet is necessary.

10. Uric acid and cystin calculus cases should have their urines kept alkaline, by using the alkaline ash diet plus alkalinizing drugs. A diet low in purines is also indicated when dealing with uric acid stones.

11. The patient should determine the *p*H of his urine daily.

12. An x-ray should be made every four to six months for a period of three years after removal of the calculus.

Conclusions

The literature pertaining to recurrent urolithiasis has been carefully reviewed and summarized. The etiology of recurrent stones has not yet been finally solved. Further experimental and clinical work needs to be done in this field. The importance of producing a minimum amount of trauma at the operating table has been emphasized. The dietary management of these cases is stressed. The postoperative measures have been outlined, and should be followed in every case of urolithiasis.

THE PRESENT STATUS OF THE MALE SEX HORMONE

FRED K. GARVEY, M. D.

WINSTON-SALEM

For ages man has attempted male sex gland therapy[1]. The earlier attempts were, of course, empirical. As early as 1678 Leuwenhoek described a substance from the testes as "spermin." In 1776 Bordeu compared the castrate capon to the eunuch and attributed sex development and sex characteristics to the testes. In 1849 Berthold demonstrated that the caponizing effects of castration in a rooster were overcome by reimplantation of testicular tissue. In 1850 Franz Leydig described the interstitial cells of the testicle, which were thereafter known as Leydig's cells, and claimed that large numbers were present in the four-months-old embryo, while fewer were present in the embryo at birth. He also found that they were abundant at puberty and diminished during the male climacterium. It was thought that these could be stimulated by

Read before the Eighth District Medical Society, Winston-Salem, April 18, 1941.

1. Eidelsberg, D. Joseph: Male Sex Hormone, Clin. North America, 22:1537 (September) 1938.

the gonadotropic hormone of the anterior pituitary gland. In 1889 Brown-Sequard claimed that he had rejuvenated himself by using extracts from dog and guinea-pig testes. In 1903 Bouin observed that ligation of the vasa deferentia in animals stopped spermatogenesis, but caused proliferation of the interstitial cells. Biedl in 1916 stressed the knowledge that epididymal disease and atrophy of the seminiferous tubules do not affect sex impulses or secondary sex characteristics, nor cause a retrogressive change in the organ or its function. Walker in 1908 produced comb, wattles, and sex behavior in capons by injecting extracts of testes.

Effect of Castration

Castration has a profound effect on the sexual development in birds and mammals. It prevents mature development of accessory sex organs. In young boys it retards ossification of the epiphyses of the long bones, increasing stature, and produces feminine adiposity, high-pitched voice, lack of beard, infantile genitalia, and suppression of sexual feeling. The pituitary gonadotropic hormones are increased in the blood and urine. The pituitary gland itself is enlarged. In animals, reimplantation of gonadal tissue or the injection of extracts changes the pituitary picture to normal. Castration in the male or female causes increased output of gonadotropic hormones, with excessive amounts in the blood and urine. This occurs at menopause, and also in the male climacterium. These effects are decreased by potent testicular extracts.

Recently there has been a standardization of the male sex hormones. Gallagher and Koch[2] described a unit as "that amount which, injected per day for five days, produces an average of five millimeters' increase in length and height of combs on at least five brown Leghorn capons." This is commonly known as a capon unit. In 1931 Butenandt obtained a pure crystalline male hormone from human urine. It was called androsterone. Gallagher and Koch[2] later obtained substances from testis tissue ten times as potent. In 1935 Laquer obtained from the testis crystals of exceptional potency, called testosterone. This has since been synthesized in the laboratory from cholesterol, and its combination with propionic acid has resulted in the production of testosterone propionate, the product in common usage today. If used early enough, testosterone propionate will counteract the effects of castration. It also has some theelin-like effect in the female. Conversely, male urine and testes contain estrogenic substances. In both sexes, certain ratios exist between androgenic and estrogenic substances, and in various pathological states, such as homosexualism, virilism, masculinization, feminization, hypertrichosis, etc., they become imbalanced because of a deviation from these ratios. There is conclusive evidence that a delicate balance exists between the anterior pituitary lobe and the testis. The pituitary stimulates activity of the testis, which in turn serves as a check on the pituitary itself. There are two gonadotropic hormones of the anterior lobe of the pituitary. One causes development of the follicles of the ovary and influences the seminiferous tubules of the testis—the so-called follicle-stimulating hormone. The other hormone causes luteinization of the follicles in the ovary and influences the activity of the interstitial cells in the testis—the so-called luteinizing hormone. Menopausal and castrate urines contain mainly the follicle-stimulating material, while pregnancy urine contains largely the luteinizing factor, under various trade names such as A.P.L., antuitrin S, and follutein. The serum of the pregnant mare contains a gonadotropic material which has both factors. Two types of hormone therapy are now possible in hypofunction of the testis: first, stimulation therapy with gonadotropic material; and second, substitution therapy with the male sex hormone. With gonadotropic material the testis is stimulated to increased activity, itself producing more sex hormones. This is to be preferred in most instances where the testicle is capable of responding to stimulation. Examples of indication for the stimulation therapy are Froehlich's syndrome, hypopituitarism with secondary hypogenitalism, and undescended testis. Substitution therapy with the male sex hormone is indicated when the testicle is not capable of producing the hormone in sufficient quantity. Among the indications for its use are eunuchism, eunuchoidism, and atrophy or destruction of the testis.

2. Gallagher, T. F. and Koch, Fred C.: Quantitative Assay for Testicular Hormone by Comb Growth Reaction, J. Pharm. and Exper. Terap. 3940:327 (September) 1930.

Clinical Application

The value of the male sex hormone is shown best by its effect on individuals with complete lack of testicular function—namely, castrates and eunuchoid individuals[3]. Bilateral intra-abdominal cryptorchidism beyond the age of puberty produces much the same condition, as the interstitial cells are involved in the atrophy. Eunuchoid individuals are tall and slender, with long extremities and narrow shoulders and chests. The voice is high-pitched, and the person is shy, effeminate, and high-strung. There is little pubic hair and no beard nor hair on the chest, abdomen, arms, or legs. The genitalia are infantile, the prostate is not palpable, and the muscles are small and feminine in type. In contrast to the Froehlich type, such patients are underweight and have no breast development. Eunuchoidism, therefore, illustrates testicular deficiency *per se*, in contrast to secondary hypogonadism in Froehlich's syndrome. Its treatment, therefore, is that of substitution, and requires large doses of testosterone propionate. Treatment produces the following effects: (1) The gradual appearance of the secondary sex characteristics of the adult male—namely, enlargement of the penis and scrotum, development of the prostate, and masculine distribution of the hair. The voice assumes its masculine quality. Erections and seminal emissions occur, and priapism has been described. (2) Marked increase in appetite and weight, with marked muscular increase. This change is very dramatic. (3) Increase in basal metabolic rate. (4) An increase in vigor and sense of well-being, with increased initiative for work, both mental and physical. (5) A loss of feminine characteristics. Intensive therapy is necessary for one to two years, and maintenance therapy for the rest of the patient's life. In the eunuchoid state due to bilateral abdominal cryptorchidism, it is desirable to begin treatment just before normal puberty, or at the age of 11, to prevent the abnormal skeletal development characteristic of the eunuch.

Froehlich's Syndrome: In Froehlich's syndrome the therapy should be that of stimulation preferably. Large doses of the gonadotropic factor from pregnancy urine are very effective in this condition. Gonadotropin, found in pregnant mare's serum, may also be highly effective. If the testes do not respond to stimulation, then testosterone propionate may be used.

Undescended Testicle: Within recent years much has been written on the use of hormones in cryptorchidism. Many reports of their use in such cases have been published, with results varying from a large percentage of descent in some series to practically none in others. It is likely that our enthusiasm for a new type of therapy has led us to expect too much of a not-too-well-understood method of treatment without having a proper understanding of the factors involved and without a proper selection of cases. This probably accounts for the great divergence of opinion as to results obtained. Cryptorchids can be classified into three general groups: (1) those presenting associated endocrinal pathology such as Froehlich's syndrome; (2) those with fixed, mechanically retained testes; and (3) a group in which the testes are definitely movable in the inguinal canal and in some instances may be manipulated into the scrotum. This latter group comprises about 25 per cent of the cases, and it is probable that in the majority of these the testicles would descend at puberty unaided by hormone therapy. The first group, which is associated with hypogenitalism, responds better to treatment than either of the other two, and it is probably the only one with a direct indication for hormone therapy. The substance of choice to be used in the treatment of undescended testicle is the anterior pituitary-like principle of pregnancy urine[4]. This works by stimulating the interstitial cells of the testes to produce male sex hormone, which in turn causes descent in about one-fourth of the cases in young boys. The same results may be produced with testosterone itself, but testosterone has been shown by various investigators[3] to produce injury to the seminiferous tubules, temporarily at least, with deficiency in both quantity and quality of sperms. A word of caution must be given against the indiscriminate use of hormone therapy even if the cases are properly selected, because of the fact that both anterior pituitary lobe substance and testosterone may cause excessive genital growth[5] in young boys and

3. Thompson, W. O. and Heckel, N. J.: Male Sex Hormone, J. A. M. A. 113:2124 (December 9) 1939.

4. Cohn, Samuel: Anterior Pituitary-like Principle in the Treatment of Maldescent of the Testicle, J. A. M. A. 103: 103 (July 14) 1934.

5. McCullagh, E. Perry: Treatment of Testicular Deficiency with Testosterone Propionate, J. A. M. A. 112:1037 (March 18) 1939.

stimulate an increased rate of skeletal growth[5]. Many cases have been reported of boys 5 to 10 years of age where prolonged treatment has produced precocious puberty, with external genital changes of adult proportions. Sex hair growth has been induced and voice changes, erections, and seminal emissions stimulated. From most authentic reports one gathers that if descent is to be produced, it will be effective within two or three months of therapy. I have recently seen a case of marked puberal precocity in a boy aged 12, from therapy carried out over a period of more than a year. It will be interesting to see whether this will be followed by a retardation of growth as adolescence approaches. The following rationale of treatment is generally accepted: (1) A careful examination is made to determine whether the testis is undescended or merely retracted. (2) Treatment should be started preferably between the ninth and eleventh years of age. Exceptions to this are complications such as hernia and patients with definitely hypoplastic genitals. In the latter, if therapy is prolonged, it is important to watch for precocious bone maturation. (3) Antuitrin S is used in a dosage of 200-400 rat units two or three times weekly until 4,000 rat units have been administered. If at the end of such a course only partial descent occurs, the course may be repeated in six months. If there has been no change at all in the position of the testes, operation is advised.

Benign Prostatic Hypertrophy: In 1932 Lower and McCullagh[6] became interested in a hypothesis that glandular imbalance may be a cause of prostatic hypertrophy and that a nonsurgical type of treatment might be worked out for the relief of this condition which so commonly occurs in men past the age of 50. The origin of hormonal treatment in prostatic hypertrophy was the observation made many years ago that eunuchs and other castrates never had prostatic enlargement. This led to the advocation of orchectomy and later to the ligation of the vasa deferentia to effect shrinkage of the enlarged prostate. No explanation could be offered for the rationale of such a procedure. Lower's new interest in the relationship of the endocrine glands and prostatic hypertrophy hastened animal experimentation and research which laid the foundation for male hormone therapy in this condition. He showed in experiments on rats that the testicle possesses a dual endocrine function: that the seminiferous tubules excrete, first, a water-soluble hormone during the active sex period of the male called "inhibin"; and second, an oil-soluble hormone known as testosterone. As old age approaches, inhibin, which inhibits the effect of the pituitary gland, is the first hormone to give out because of atrophy of the germinal epithelium. It is thought by Moore and others that the interstitial and germinal hormones act as complements to each other. The clinical application of these experiments is the use of inhibin in the treatment of prostatic hypertrophy. Other experimenters believe that prostatic hypertrophy is due to changes in the estrogenic-androgenic ratio, and their experiments lead them to believe that testosterone can prevent prostatic hypertrophy or produce atrophy of an already hypertrophied prostate. Lower claims marked relief of subjective symptoms in 50 to 66 per cent of cases treated with inhibin, but claims no marked change in the size of the gland or lessening of the residual urine. Laquer and others report encouraging results from the use of testosterone on the basis of estrogenic-androgenic ratio. Still others believe that the relief of symptoms is due to increased muscle tonus of the body generally. There seems to be no unanimity of opinion as to the value of hormonal treatment in prostatic hypertrophy, and surgery still is the final resort in the large majority of cases. There probably is no doubt that this condition is brought about largely by endocrine imbalance, and it is believed that in the near future a proper understanding and therapy will be worked out.

The Male Climacteric[7]: There is a reasonable basis for the belief that many, if not all men pass through a climacteric period similar to that of women, usually in a less severe, but perhaps more prolonged form. The cessation of menstruation in the female has been known for ages to indicate not only the end of the child-bearing period, but a decline in her sex function. It represents only a visible evidence of endocrine imbalance. There is also a decline of sex function in men, which means a decline in gonadal function, that comes on at a little later period in life than that occurring in women. The

6. Lower and McCullagh, quoted by Meltzer, Maurice: Male Hormone Therapy of Prostate Hypertrophy, Journal-Lancet, 59:279 (June) 1939.

7. Werner, A. A.: The Male Climacteric, J. A. M. A. 112:1441 (April 15) 1939.

average age of onset in men is approximately 48-52 years. The climacteric symptoms in men may be classified, as in women, as nervous, circulatory, and general in distribution. The more prominent symptoms are subjective, such as nervousness and emotional instability, characterized by irritability, moodiness, decreased memory and ability for mental concentration, decreased interest in the usual activities, a desire to be left alone, and attacks of depression. There may be neurocirculatory changes, such as hot flashes accompanied by profuse perspiration or followed by a chilly sensation. There may be tachycardia and palpitation, vertigo, numbness and tingling of the extremities, fatigability, and disturbed sleep. These climacteric disturbances may be so severe in some men as to cause despondency and psychoses, with thoughts of self-destruction. It is probable that suicide has been the result of such disturbances in many cases. Involutional melancholia is known by psychiatrists to occur in men, and institutions contain many of such cases.

Testosterone has been remarkable in its effect on patients with this condition. Within a short time under adequate treatment there is remarkable clinical improvement characterized by increase in feeling of well-being, a return of normal sex function, and great changes in the entire mental attitude of such patients. Despondency gives way to a feeling of buoyancy, and there is a new feeling, both mental and physical, of aggressiveness, with less irritability and brooding. Nervousness and emotional instability are replaced by greater stability and control. There is less fatigue, as evidenced by new energy and stamina.

Impotence: Probably the most common abuse of the male sex hormone has been its promiscuous use in attempting to relieve impotence. Since it is of value chiefly in substitution therapy[3], it can only be effective when there is deficiency of testicular function. There are very few conditions where it would be indicated. The majority of cases of impotence during the sexual age are psychogenic in origin. Others, of course, are due to sexual fatigue. The former require psychotherapy, while the latter require proper rest and a more rational conception of masculine prowess. There are, however, cases of impotence occurring between the ages of 45 and 55 which may be classified in the climacteric group and which by the administration of testosterone in adequate doses over a period of many months may be restored. The most gratifying and definite effects have been noted with the administration of 10 to 20 mg. of testoterone weekly to this group.

Other Uses of Testosterone[8]: There are other clinical uses for testosterone claimed by many writers with which I have had no experience, notable among which is its use in the female. This therapy is based on the bisexual properties of testosterone and the normal existence of androgenic substance in the female. It is claimed that gratifying results have been obtained in the menopausal syndrome, in metrorrhagia, in dysmenorrhea, and in inhibiting postpartum lactation and postpartum pains. Its use in such conditions is certainly outside the realm of urology and cannot be properly discussed in this paper. Its mention at this time is merely to emphasize the existence of a puzzling and definite interrelationship of male and female endocrines, the understanding of which certainly is in its infancy. Truly, one of the greatest fields in medicine will be developed when the mystery of the endocrine system has been unveiled. Then the male sex hormone will undoubtedly play an important role in future glandular therapy.

8. Ciba Pharmaceutical Products Co., Inc.: Perandren in the Treatment of Males and Females.

Squibb Introduces Product For Simultaneous Immunization Against Diphtheria and Whooping Cough

The first preparation for simultaneous immunization against diphtheria and whooping cough to be made available commercially in this country is now offered by E. R. Squibb & Sons, New York, in Diphtheria Toxoid Alum Precipitated—Whooping Cough Vaccine Combined Squibb. Each 1 cc. of the combination product contains a full immunizing dose of Diphtheria Toxoid Alum Precipitated and 10,000 million killed Bacillus (hemophilus) pertussis.

To be on the safe side, it is suggested for the present that three or four injections of 1 cc. each of Diphtheria Toxoid Alum Precipitated—Whooping Cough Vaccine Combined Squibb be given at monthly intervals. This will confer a high degree of immunity to diphtheria and should afford adequate protection against whooping cough. Immunization is recommended for all children over six months of age.

Diphtheria Toxoid Alum Precipitated—Whooping Cough Vaccine Combined Squibb is supplied in 5 cc. vials containing sufficient vaccine for five injections.

SOME FEATURES OF "VIRUS PNEUMONIA"

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DURHAM

During the past few years a number of clinicians have reported cases of an atypical form of pneumonitis, at times occurring in isolated instances, and again assuming epidemic proportions. Many of these cases have conformed to a more or less definite clinical pattern and have presented striking features which serve to differentiate them from the more familiar forms of bacterial pneumonia. Although no etiological agent has been determined with certainty, it is felt that the disease is probably due to infection by a filtrable virus[1, 2].

Certain articles in the recent literature—notably those of Reiman and Havens[1], Longcope[2], Kneeland and Smetana[3], and Murray[4]—are worthy of particular mention because of the thorough descriptions of the clinical features of "virus pneumonia" in relatively large numbers of cases. Despite the reports of these and other authors, and despite the incidence of the disease, many times the isolated case remains unrecognized until several days have passed. This failure to recognize the disease early may result in the employment of faulty isolation technique, with consequent cross-infection which may at times reach severe proportions. Erroneous diagnosis may also lead to improper therapy.

The following three cases serve to re-emphasize the clinical features of "virus pneumonia", and illustrate the possibility of cross-infection.

Report of Cases

Case 1: E. W., a college student, aged 20, was admitted to Duke Hospital on October 4, 1941, with the complaint of a "cold in the chest" for the past twenty-four hours. His family history was of no significance. His past history was of interest in that he had had Type III pneumococcal pneumonia in 1938, with uneventful recovery after treatment with specific serum and one of the sulfonamide drugs. Two weeks before the onset of his illness a routine tuberculin test was negative.

Approximately twenty-four hours before admission the patient "caught cold", associated with headache and rhinorrhea. Shortly after this he developed a rasping, non-productive cough. There was no chest pain, chill or respiratory distress. The morning of admission to the hospital, eighteen hours after onset, he felt "chilly" and ill with moderate weakness.

On admission the patient's temperature was 39.1 C. (102.4 F.), the pulse 100, respirations 20 and blood pressure 118 systolic, 70 diastolic. He was a well developed and well nourished white male who appeared moderately ill. He was alert and well oriented. The skin was hot and moist but of good color and texture. There was no generalized enlargement of the lymph nodes, but a few small cervical nodes were palpable bilaterally. Examination of the head, eyes and ears showed nothing remarkable. There was a slight mucoid nasal discharge. The mucous membrane of the pharynx was inflamed, but there was no exudate. Examination of the lungs showed a small area of dullness to percussion posteriorly just beneath the angle of the left scapula, with suppressed breath sounds over the same area. There was no friction rub, and no rales were heard. The remainder of the physical examination showed nothing of significance.

The following admission laboratory data were obtained: hemoglobin, 15.7 Gm.; red blood cell count, 5,080,000; and white cell count, 9,400. The differential white cell count was 70 per cent segmented neutrophils, 10 per cent non-segmented neutrophils, 1 per cent monocytes, 3 per cent large lymphocytes and 16 per cent small lymphocytes. Examination of the urine showed nothing abnormal. A moderate degree of consolidation in the left lower lobe of the lung was revealed on x-ray examination.

The patient's course in the hospital is of interest. Before chemotherapy was instituted a throat culture was taken which showed alpha streptococci and Neisseria sicca. A blood culture was reported five days later as sterile. A small amount of sputum was raised with difficulty and culture of this material was reported as showing numerous colonies of alpha streptococci and an oc-

From the Department of Medicine, Duke University School of Medicine and Duke Hospital. Submitted for publication December 4, 1941.

1. Reiman, H. A. and Havens, W. P.: An Epidemic Disease of the Respiratory Tract, Arch. Int. Med. 65:138-150 (January) 1940.
2. Longcope, W. T.: Bronchopneumonia of Unknown Etiology, Bull. Johns Hopkins Hosp. 67:268-305 (October) 1940.
3. Kneeland, Yale, and Smetana, H. F.: Current Bronchopneumonia of Unusual Character and Undetermined Etiology, Bull. Johns Hopkins Hosp. 67:229-267 (October) 1940.
4. Murray, M. E.: Atypical Bronchopneumonia of Unknown Origin, New England J. Med. 222:565-573 (April 4) 1940.

casional colony of beta hemolytic streptococcus. No pneumococci were seen on direct smear, and the mouse inoculated with the material was alive and well at the end of twenty-four hours.

Two hours after admission the patient was given 2 Gm. of sulfathiazole, and thereafter he was given 1 Gm. every four hours. Ten hours after sulfonamide therapy was begun his temperature began to fall, and after eighteen hours of treatment the temperature was normal. Twenty-four hours after admission, however, the temperature rose steadily to 40 C. (104 F.) and thereafter fluctuated between 38.6 C. (101.5 F.) and 40.2 C. (104.4 F.) for thirty-six hours. Throughout the febrile phase of the illness there was a relative bradycardia, the pulse ranging between 80 and 100; even when the temperature was highest the pulse rate was 102 to the minute. Because of the relative bradycardia it was felt that some of the patient's temperature might be due to sulfathiazole. Just before discontinuation of the drug, however, the temperature fell to normal spontaneously, and even after discontinuation of the drug the temperature fluctuated between normal and 39.4 C. (103 F.) for three days.

On the third hospital day x-ray showed some clearing of the pneumonic process at the left base. The patient appeared somewhat better clinically and did not complain so bitterly of the headache which had been a prominent feature from the outset. The harassing, paroxsymal cough which was present on admission persisted, however; and only on occasion was he able to produce a small amount of mucopurulent sputum. Repeated studies of this material were negative for acid-fast organisms and the routine cultures and mouse inoculations failed to show any pneumococci. Three subsequent blood cultures showed no bacterial growth.

On the sixth hospital day, as the temperature was falling by lysis, the white cell count was reported as 9,100 with essentially the same differential as previously. Two subsequent leukocyte counts were 8,700 and 8,900. At no time was the white cell count as high as 10,000.

On the seventh hospital day the physical signs in the left chest had disappeared, but scattered rales were heard throughout the right chest. X-ray at this time showed a distinct change, in that the previously described localized area of consolidation on the left was broken up into a patchy consolidation and there was now a marked spread throughout the right lung, where there was a patchy consolidation which tended to follow bronchovesicular distribution. There was no appreciable change in the patient's clinical condition coincident with the spread of his pneumonia. After the eighth hospital day his temperature did not exceed 37 C. (98.6 F.) at any time. He remained in the hospital for ten days after becoming afebrile, and during that time there was gradual improvement. His cough, which had never been very productive, gradually subsided. On the eighteenth hospital day he was discharged symptom-free except for some residual weakness. A chest plate taken four days before discharge showed that the pneumonic process had practically cleared.

The patient was seen three weeks after discharge from the hospital. At this time he was well and a tuberculin test was negative.

Case 2: I. W., a nurse, aged 22, was admitted to the hospital October 20, 1941. Three days before admission and thirteen days after nursing E. W. (case 1), she developed generalized aching and malaise. The following day she felt feverish and developed a cough productive of small amounts of mucopurulent sputum. When she was admitted to the hospital the next day her physical examination was essentially normal, although x-ray showed an area of infiltration in the right upper lobe of the lung. Sputum studies were repeatedly negative for acid fast organisms, and although there were a few pneumococci present in the sputum, the type could not be determined directly or by mouse inoculation. On admission the white blood cell count was 9,000, and although the count was repeated on several occasions it was never above this figure. A blood culture was sterile.

The patient's temperature on admission was 38.2 C. (100.8 F.). She was started on sulfadiazine immediately, but for four days her temperature fluctuated between normal and 39.6 C. (103.3 F.); after that it fell by lysis and remained normal throughout her hospital stay. On the fifth day a number of coarse, moist rales were heard over the area of pneumonitis, and at this time x-ray showed a diffuse, scattered mottling in the right upper lobe. From this time on the patient improved rapidly. She was dis-

charged on the sixteenth hospital day, at which time x-ray showed her lungs to be clear.

Case 3: C. S., a nurse, aged 18, was admitted to the hospital on October 24, 1941, seventeen days after her first exposure to E. W. (case 1) in the course of her nursing duties. For the past three weeks she had experienced a mild cough productive of small amounts of mucopurulent sputum, but despite this she had felt well. Two days before admission she felt "chilly" and feverish. The following day her temperature was found to be 38 C. (100.4 F.), and she went to bed. The next day she felt no better and was admitted to the hospital. Her temperature on admission was normal and the physical examination negative except for a few palpable cervical lymph nodes and an injected pharynx. The white blood cell count was 6,900.

Shortly after admission her temperature suddenly spiked to 40.5 C. (104.9 F.) without chill. At this time her chest was clear to physical examination, but x-ray examination of the chest showed a homogeneous density extending from the hilum to include the left lower lobe of the lung. The white cell count at this time was 6,000, a blood culture was sterile, and the small amount of sputum showed a mixed flora without pneumococci.

The patient was started on sulfadiazine, but her temperature ranged between 37 C. (98.6 F.) and 40.6 C. (105.1 F.) for five days, after which it dropped by lysis and remained normal. The day after the appearance of the lesion by x-ray an area of corresponding dullness to percussion was noted on physical examination, and over the same region there were many fine and coarse rales.

Following the fall in temperature the patient improved rapidly, and was discharged on the fourteenth hospital day. On discharge x-ray showed the lungs to be clear.

Discussion

These three cases possess certain common features which deserve emphasis. In all three the onset was characterized by a harassing, at times paroxysmal cough, which was either non-productive or productive of only small amounts of mucopurulent sputum. There was no accompanying pleurisy. Bacteriological studies of the scanty sputum and of the blood failed to demonstrate the etiology of the disease. In all three patients repeated white blood cell counts were normal or only slightly elevated.

The temperature in all three cases was rather high during the first few days of the disease, and in each there was an accompanying relative bradycardia, until the temperature fell by lysis on the fifth to seventh day. In two of the three patients no physical sign of pneumonia was demonstrated until the lesion had been diagnosed by x-ray. Physical signs were, when present, those of incomplete consolidation which corresponded to the patchy, migrating lesions demonstrated by x-ray.

In each instance the disease was refractory to sulfonamide therapy. What part the sulfonamides played in preventing secondary bacterial infection is a matter of speculation.

Although deaths in "virus pneumonia" have been reported, for the most part the disease runs a relatively benign course. These three patients were never considered seriously ill. Kneeland and Smetana[3] reported one death in fifty-two cases, while Longcope[2] reported two deaths in thirty-two cases. Both of the patients reported by Longcope had pre-existing heart disease.

The communicability of the disease is well attested by the three cases presented. In Longcope's series twelve of the thirty-two patients had been in direct contact with other patients suffering from the same form of pneumonia. Reiman's cases occurred in epidemic form among a hospital personnel. These reports indicate the high incidence of cross-infection.

Conclusions

(1) Three cases presenting the clinical picture of "virus pneumonia" are reported. Cases 2 and 3 probably represent cross-infection from Case 1.

(2) The disease is probably a distinct entity, the clinical features of which are constant enough to permit recognition during the first few days.

(3) The disease is highly communicable.

(4) Sulfonamide therapy does not affect the primary course of the disease, although such therapy is indicated in an effort to avoid secondary bacterial infection.

(5) For the most part the disease runs a relatively benign course, although there are a number of reported deaths.

OCCUPATIONAL DERMATOSES

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The recognition of occupational skin diseases comprises a very important field in medical practice. Occupational dermatoses make up 65 to 70 per cent of all disabling diseases to which manual workers are subject. More attention has been focused upon accidents and the inhalation of noxious fumes because of the deaths and loss of limbs caused thereby, but the most important disease from the standpoint of time lost is certainly occupational dermatitis. There is a widespread lack of information concerning the etiology and possible preventive measures in occupational skin disease. It is interesting to note that although the number of claims for compensation due to industrial diseases in the state of North Carolina have been increasing yearly in proportion to the number of persons employed, the number of days' work lost in the average case has been steadily decreasing. This may indicate that the treatment has become more effective, or that industrial diseases are being seen and diagnosed earlier; but it is evidence also that little or no progress has been made in the prevention of such diseases.

Occupational dermatoses are those diseases of the skin which are due wholly or in part to noxious agents encountered during employment, and they include industrial dermatoses which are limited to manufacture and mining. The legal elements involved in proving or disproving that the disease in point is, or is not, due to hazards encountered during employment are not within the scope of this discussion. We shall confine ourselves to the consideration of (1) the diagnosis and the best available methods of proof of the occupational nature of a dermatosis, and (2) the best known means of preventing occupational skin disease.

Read before the Section on the General Practice of Medicine and Surgery, Medical Society of the State of North Carolina, Pinehurst, May 21, 1941.

From the Section of Dermatology and Syphilology of the Department of Medicine, Duke University School of Medicine.

Diagnosis

In general, an occupational dermatosis is limited to the exposed areas—the hands, the face, the neck, and the ankles. It presents in its various stages manifestations ranging from a simple erythema over a small area to large, thick, and painful callosities. It is important that the actual working conditions of each patient be known before interpretation of any presenting lesion be attempted. Fortunately most occupational dermatoses fall into two groups: (1) traumatic and (2) contact. An element of both groups enters into some dermatoses.

The etiology of the traumatic type of skin disease—exemplified by the callosities of tool workers, and the horny thickening with atrophy in the potter's left hand—is generally made apparent by the history. The etiology of the contact type is less obvious, but it commonly begins as an erythematous and vesicular eruption limited early in its course to the areas exposed to the offending agent or agents. This group is typified by the vesicular, fissured eruption of the hands in toolmakers, which is due to cutting oils, and by the erythematous, swollen, and vesicular dermatitis of workers in volatile substances such as trinitrotoluol in the manufacture of some explosives. A follicular and pustular eruption is frequently seen in petroleum industry workers, especially about the forearms and other hairy parts. Each industry and occupation presents a problem peculiar to itself. The climate, the environment within the plant, the general health and nutritional state of the employee, as well as the occupation enter into the etiology of a dermatitis. The worker whose hands are continually wet, or who sweats profusely, may be intolerant of an ordinarily innocuous substance. The softening of the horny layer of the skin breaks down an important barrier to infection and irritation, so that oils, soaps, fumes, and perspiration, as well as actual trauma, may permit substances which ordinarily are not irritants to produce an injury to the skin. For this reason it may be very difficult to reproduce or to explain satisfactorily any given dermatosis unless the patient is observed under conditions which originally produced the skin disease. Dust in the air, dirt, heat and cold, all may be important.

A diagnosis of occupational dermatosis may safely be made if the following conditions are met:

(1) The disease occurs during employment.
(2) The disease tends to clear up when the patient is away from his work.
(3) The disease reappears when the employee resumes working under the same conditions.
(4) Other workers doing the same work present similar diseases.
(5) The disease may be reproduced or simulated when the worker is exposed to the offending agent by the "patch test".
(6) Other possible causes, such as irritants from hobbies, work in the home, or other diseases can be excluded.

Those dermatidides primarily due to exposure to irritating substances generally respond readily to local therapy and rest, away from the occupational hazard. However, in cases with previous exposure, in which a hypersensitivity develops, the resultant dermatosis may be exceedingly difficult to control, and indeed, may have a course of two to three years. This group of cases should be prevented by early recognition of the cause of the dermatosis. A photographer's assistant presenting a localized eruption on the hands was found upon patch testing to be so sensitive to "metol" that it produced a mild generalized eruption lasting a few days. When he recovered he resumed his work, and instead of a localized eruption he developed a severe generalized and exfoliating type of eruption which persisted for five months. This type of hypersensitivity is relatively common and should be carefully looked for so that the employee may avoid re-exposure.

The patch test is, within certain limits, a valuable means for determining hypersensitivity. Briefly, it consists of applying to the skin in dilute form under a protective covering the substance which is suspected of being the primary cause of a dermatitis. This is permitted to remain in contact with the skin for twenty-four hours, and if the reaction is positive an irritation will be observed at the end of this time. A positive reaction does not, however, prove that the substance used for the test is entirely responsible for the dermatitis in question. The substance used in the test may be a primary irritant, and as such it will produce an eruption whenever a worker is exposed to it. If the test is negative it may mean that environmental conditions at the place of employment are partly responsible, and a combination of environment and irritant may be needed to produce a positive test. This is frequently impossible to obtain. It is also known that a previous sensitization to one substance may provoke a cutaneous reaction to another by synergistic action. By and large, however, when employed with the suspected irritant suitably diluted, and with two or more controls, the patch test is strong evidence that the substance causing a reaction is the offending agent.

In summary, the diagnosis of occupational disease rests upon a history of exposure to possible irritants, with occurrence of similar lesions in other workers employed under the same conditions, and the clearing of such eruptions when the patient remains away from the suspected substance. The reproduction of the eruption by means of the patch test strengthens the diagnosis. It is necessary to remember that exposures at home, or during other employments, may produce the same type of dermatosis, and that these factors must be inquired into. It is not always easy to eliminate non-occupational diseases such as seborrheic dermatitis, mycotic infections of the hands and other areas, psoriasis, and pyogenic dermatoses. It is well known that some of these diseases predispose to other skin eruptions, particularly those of the contact type. Careful study is needed to interpret correctly the presenting lesions.

Prevention

Any program for the prevention of occupational disease should receive the cooperation of all agencies interested: the employer, the employee, insurance carriers, and the industrial commission of the locality. This preventive work is steadily progressing. Hygienic plant conditions, protective clothing, adequate ventilation, and general cleanliness of the place of employment, machinery, and workers themselves are important. Adequate facilities for employees to wash and to take showers, if necessary, should be provided. In certain industries the clothing worn by the worker should be thoroughly washed each day, and the soaps and other

cleansing agents used should be tested to see that they are not unnecessarily irritating. Protective creams and emollients should be supplied whenever they are needed. Sometimes it is possible to change the mode of manufacture, or the substance used in a process, and this has been found beneficial both to the worker and employer at times.

The industrial physician plays an important part in examining the prospective employee. Applicants with obvious skin diseases—ichthyotic, seborrheic, or allergic—should not be employed near possible irritants. Widespread or active mycotic disease should be remedied before employment. A history of previous eruptions due to irritants or relatively innocuous substances should be considered in the placement of the applicant. The use of the patch test may be introduced to predetermine sensitivity to irritants which are used in the work; however, only a positive test is helpful, for sensitivity will develop after varying lengths of exposure. It may be found advantageous to employ the Negro in occupations where irritating substances are used, as the colored race is definitely less susceptible to irritants of many types, and in particular to photosensitizing agents. Workers with very hirsute bodies should probably be excluded from working with petroleum products, as they are likely to develop follicular dermatidides. Women are usually more cleanly in their habits, and may be employed with benefit in some occupations.

Treatment

The earlier treatment is begun and the milder the medication, the better will be the general result. If the dermatosis be allowed to continue without therapy serious disease of a chronic nature may result, and therapy may be much less helpful. Removal of the causative agent or agents is imperative for cure. A change of occupation and cessation from all work for a time may work a hardship upon the employee, but if no means to counteract the irritant can be found there is little else to be done. Local therapy should be used with the understanding that one is dealing with an already irritated skin. In early cases soothing applications are indicated. The use of simple antipruritic lotions, saline, potassium permanganate, or aluminum acetate compresses are helpful in all acute dermatoses, no matter what the offending agent, and all patients should avoid the use of soap and water or friction. Older and more chronic eruptions may require the use of crude coal tar ointments, or other similar preparations, and usually they will also need the advice and judgment of a dermatologist trained in the diagnosis and treatment of such difficult problems.

Abstract of Discussion

Dr. W. L. Kirby (Winston-Salem): I am interested in the question of whether or not those cases in which allergies are responsible for the patient's occupational disease are compensable.

Dr. Williams: Some authorities have included in their criteria for diagnosis the re-exposure of the patient to identical occupational environs under well controlled conditions after a suspected occupational dermatitis has cleared up. If such a re-exposure causes a similar dermatitis, compensation is usually given. I think most compensation commissions recognize that an occupational dermatitis causing a flare-up of a pre-existing dermatitis during the time the patient is employed is almost always deemed compensable. For that reason we have discussed the importance of clearing up these pre-existing skin conditions before the patient is employed in any occupation where he must work with irritants.

There is an old idea that when you do not know what to do, you must do something. Nothing could be further from the truth. When you do not know what to do, do nothing rather than do something for the mere sake of activity.—Willard O. Thompson: Common Sense in the Practice of Medicine, Illinois M. J. 80:368 (November) 1941.

"Is This Product Council-Accepted?"

This is the first question many physicians ask the detail men, when a new product is presented.

If the detail man answers, "No," the doctor saves time by saying, "Come around again when the Council accepts your product."

If the detail man answers, "Yes," the doctor knows that the composition of the product has been carefully verified, and that members of the Council have scrutinized the label, weighed the evidence, checked the claims, and agreed that the product merits the confidence of the physicians. The doctor can ask his own questions, and make his own decision about using the product, but not only has he saved himself a vast amount of time but he has derived the benefit of a fearless, expert, fact-finding body whose sole function is to protect him and his patient.

No one physician, even if he were qualified, could afford to devote so much time and study to every new product. His Council renders this service for him, freely. Nowhere else in the world is there a group that performs the function so ably served by the Council on Pharmacy and Chemistry and the Council on Foods.

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COMBINATION OF THE CLAVICULAR CROSS AND FIGURE OF EIGHT DRESSING IN TREATING FRACTURES OF THE CLAVICLE

W. EDWIN MILLER, M. D.
WHITEVILLE

The purpose of this paper is to review the basic principles in the treatment of fractures of the clavicle and to demonstrate a technique of applying the clavicular cross which is different from that described in the textbooks in that it combines the figure of eight dressing with the cross.

It is said that over 200 different methods have been described for treating fractures of the clavicle. This number indicates that none of these methods have proved satisfactory in the hands of many physicians. After a review of the literature on the subject, my impression is that efforts to devise more satisfactory appliances for the ambulatory treatment of this fracture have tended to complicate rather than simplify it. No one method is satisfactory in every case; but if attention is paid to detail in applying the clavicular cross, I find that this method gives fair cosmetic and very good functional results in the majority of fractures of the clavicle.

To treat any fracture correctly one must be fairly familiar with the anatomy of the part and know the general mechanics involved. The clavicle serves as a strut to hold the shoulder in its normal position, and is the only bony connection between the shoulder girdle and the trunk. When this support is broken and the fragments overlap, two forces act to produce the deformity —namely, gravity and muscle pull. In most fractures of the clavicle the characteristic deformity is a downward, inward, and forward slumping of the shoulder on the affected side. All who have seen many injuries to the clavicle have observed that the fracture usually occurs in the outer part of the middle third. Several reasons are given for this. At this point in the clavicle there is a junction of two curves, and the bone is thinner. The clavicle is without ligamentous or muscular attachments at this site. This last reason is thought by some authors to be the most plausible. When a fracture of the clavicle occurs, the inner fragment is rarely displaced to any marked extent. Although the sternocleidomastoid muscle tends to pull this fragment up, the costoclavicular ligament tends to prevent this displacement. The outer fragment moves with the shoulder, being displaced downward, inward, and backward by the force of gravity and the pull of muscles attached to the fragment and the shoulder.

Submitted for publication July 28, 1941.

Etiology

In the majority of these cases the fracture of the clavicle is due to a sudden blow received directly on the shoulder or transmitted to the shoulder through the outstretched arm. Today automobile accidents are responsible for most of the bad fractures. Many patients receive fractures of the clavicle while engaging in athletic sports. It is estimated that about 1 per cent of babies receive fractures of the clavicle due to compression in the birth canal.

Diagnosis

The typical fracture of the clavicle is fairly easy to diagnose. In the greenstick type there is an angular deformity at the fracture site. In cases where the fragments overlap, the shoulder drops downward, forward, and inward. The patient usually holds the forearm on the affected side with the opposite hand. There is a history of trauma. On palpitation over the clavicle tenderness is noted; if some time has elapsed since the injury, swelling is also present. In young children the mother may notice that the child does not use one upper extremity well and cries with pain when lifted by the arms. The x-ray is the greatest aid in making a definite diagnosis of any fracture. The shoulder on the affected side should be exposed with the clavicle to rule out other fractures. Because the clavicle is easily palpable one should be able to treat these fractures very well without the aid of the x-ray picture; however, it is best to have a roentgenogram if possible.

Treatment

The object of treatment is to correct the deformity and to maintain reduction with the least amount of trauma to the soft parts and with maximum comfort to the patient.

Some objections to the clavicular cross are: (1) It makes an unsightly dressing; (2) it is one of the most uncomfortable

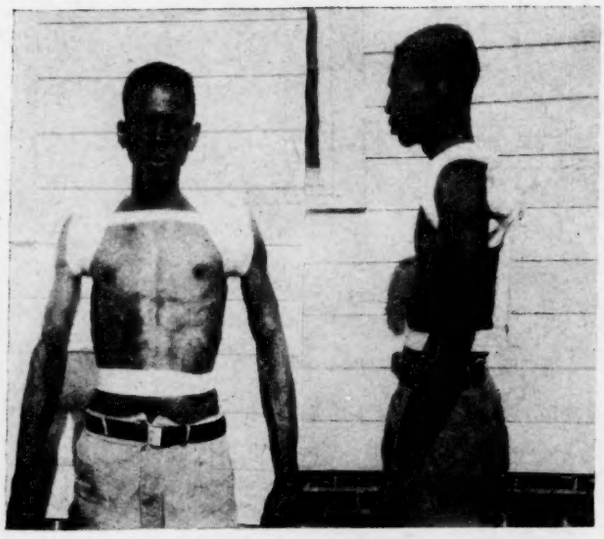
dressings; (3) it does not maintain reduction.

We are not particularly interested here in streamlining the dressing for fractures of the clavicle. If full attention is paid to detail in the application of the splint, it is possible to make the patient fairly comfortable. No ambulatory treatment in my hands has made it possible to eliminate all discomfort. As to maintaining the reduction, I have found that the clavicular cross will elevate the shoulders. Eliason makes this statement: "The contour of the ribs is such that if the shoulder is pushed back it will of necessity be pushed up. In other words, if the shoulder can be held back it will stay up and the outer fragment will fall in place."

Most authors agree that the best method for treating fractures of the clavicle is to place the patient in bed on a firm mattress and apply lateral traction to the arm on the affected side. This may be the treatment of choice in complicated cases where there are associated fractures of the scapula or humerus and possibly in those cases where the clavicle is badly comminuted and the fragments displaced. In such instances traction is applied for some two or three weeks; then some ambulatory apparatus is applied. If the patient is a young lady who demands the best anatomical and cosmetic results, the lateral traction method should be employed.

Open reduction is seldom resorted to in the treatment of fractures of the clavicle. I have had one case where interposed soft parts prevented satisfactory reduction after lateral traction had been tried.

A home-made clavicular cross is desirable, since it can be made to order for any patient. This type of apparatus is not expensive and can be held in position better than manufactured splints with buckles which the patient can loosen when he chooses. The splint may be made of any light wood thick enough (about one-half inch) to hold the shoulders back. Careful padding of the splint makes it fairly comfortable for the patient. The horizontal part of the cross should be wide enough to act as a spreader for the shoulder strap, thus preventing any undue pressure on the axillary nerves and vessels. The vertical part of the cross should be about two by one-half inches and should extend from the level of the shoulders down to the second lumbar vertebra. After the splint and shoulder straps have been well padded the



cross is ready to be applied. The patient is seated on a low stool and an assistant holds the cross against the patient's back. The shoulder strap is first applied to the normal shoulder and then to the injured side. If there is an angulation of the fragments forward, a felt pad is placed over this point and pressure is made on the pad by straps of adhesive starting on the front of the chest and extending across the shoulder to the back. The shoulder straps of the cross are fastened together in front by a piece of bandage or a strip of adhesive. A figure of eight dressing is then applied to the shoulders, including the horizontal piece of the cross, thereby making the shoulder straps secure. The vertical piece is then brought against the patient's back by means of a belt about his waist passing over the lower end. Such an apparatus in my experience gives good results in the large majority of cases of fractured clavicle. It is simple, inexpensive, and available anywhere at any time.

Combinations of Liver Extract and Iron.—We may say that the therapeutic indications on the one hand to stimulate red cell maturation and on the other to adequately stock the body with sufficient iron for hemoglobin production, are so definite as to make the various combinations of liver extract and iron as illogical as they are expensive. An individual in whom liver therapy is indicated will need continuous and persistent treatment during life. This situation does not obtain in the iron deficiency group for once the reserve has been replenished and causal factors eliminated, the necessity of further treatment ceases. Furthermore, the use of such combinations greatly increases the probability of inadequate dosage of whichever factor chances to be the required one.—Philip F. Eckman, M.D.: Indications for Use of Iron in Treatment of the Anemias, Minnesota Medicine, 23-712 (October) 1940.

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JANUARY, 1942

THE SOBER NEW YEAR

The whole world faces the New Year soberly. Virtually every nation is involved in a struggle for existence. In our country there is little of the Sir Galahad complex with which we rather gaily went to the rescue of Democracy in the first World War. We now care little what form of government the nations of Europe finally adopt, so long as we can keep our own.

The dastardly deed of Japan—beginning actual warfare while her ambassador of good will was ostensibly doing his utmost to come to terms with our country—succeeded in uniting the whole nation within a few hours as no other means could have done in weeks or months. The medical profession—which, as Dr. Fishbein has truly said, is the best organized profession in the country — had already done much to shoulder its share of the work of defense. It will have much more to do, in proportion to its numbers, than will any other profession except the army itself. This will mean sacrifices for all doctors—in camp, in the medical school, and in civilian practice. It is quite possible that another influenza pandemic will come; but even if it does not, American doctors will probably have the hardest year's work that they have faced since the great influenza epidemic.

Even with this grim prospect, however, the picture is not altogether dark. Signs are multiplying that the axis powers are rapidly weakening. The German people are so fanatically devoted to Hitler, and so acutely conscious of the harvest of hate they have been cultivating for years, that they will probably continue to fight until forced to realize that they have more than met their match; but this awakening cannot be postponed indefinitely. Let us hope that the end may come quickly.

Even with the whole world at war, and even with the hardships of tire rationing, possible food restrictions, and shortages of other articles, either semi-luxuries or semi-necessities, we still have in America the greatest treasure house of natural resources in the world; we still have the American spirit that does not know defeat; and we still have the compassion for the suffering of others that prompts our gifts to such agencies as the Red Cross. Our profession can say, without boasting, but with all due humility, that American medicine is the best in the world today. Let us all resolve to dedicate ourselves anew to the service of our country, and to recapture the faith that our forefathers had in themselves, in their friends and neighbors, and in their God.

* * * *

SOLOMON AND HITLER

So many wars have been fought in the name of religion and so often both sides have claimed that they had the special blessing of the Almighty, while the enemy were under His curse, that one hesitates to quote Scripture in discussing the present world conflict. A passage from Proverbs, however, seems to describe Hitler so exactly that it is given here:

Six things the Eternal hates,
ay, seven he loathes:
haughty eyes, a lying tongue,
hands that shed innocent blood,
a mind with crafty plans,
feet eager to go mischief-making,
a false witness who tells lies,
and him who sows discord within his group.

—Proverbs 6:16-19 (Moffatt's Translation.)

A CALL TO THE MEDICAL PROFESSION

An editorial in the *Journal of the American Medical Association* for December 27 has perhaps been read by most of the readers of the NORTH CAROLINA MEDICAL JOURNAL. Because of its vital importance, however, it is reprinted in full, together with the Enrollment Form.

* * *

The nation is at war. The Congress has passed an amendment to the Selective Service Act which will call for registration of every man up to the age of 65 and which will place all men under 45 years of age subject to service at the order of the Selective Service boards.

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians was established by order of the President on October 30. Thus the medical profession itself aids in determining proper distribution of the medical profession in supplying the needs of the armed forces and maintaining medical service to civilian communities, public health agencies, industrial plants and other important needs.

At a meeting of the Procurement and Assignment Service held in Chicago at the headquarters of the American Medical Association on December 18, jointly with the Committees on Medical Preparedness of the American Medical Association, the American Dental Association and the American Veterinary Medical Association, plans were drawn for making immediately available to the United States Army and Navy Medical Corps the names of physicians who wish to be enrolled promptly in the service of the government in this emergency.

On the opposite page is published a blank by which every physician may at once place his name with the Procurement and Assignment Service as one who is ready to serve the nation as the need arises. If you wish to make yourself available for classification, fill out this blank and send it at once to Dr. Sam F. Seeley, Executive Director of the Procurement and Assignment Service. When these blanks are received, they will be classified and checked with the information available in the national roster of physicians at the headquarters of the American Medical Association.

For two thousand and nine counties in the United States, lists have been prepared indicating physicians who are engaged in necessary civilian projects, public health services or educational activities from which they cannot be spared. Shortly the rest of the counties will have such lists available.

In each of the corps areas covering the United States a committee is being established, including representatives of medical, hospital, educational, dental and veterinary activities. In the individual states, committees of medical, dental and veterinarian professions are being established through which the corps area committees will exercise their functions. In each county also local committees will provide accurate information regarding the status of each member of the profession concerned.

The raising of the Selective Service age from 28 to 45 will place a great number of additional physicians in the category of those on whom the nation may call as their services are needed. Estimates indicate that some sixty thousand physicians thus become available for service and that forty-two thousand dentists under the age of 45 also become subject to call. By enrolling with the Procurement and Assignment Service immediately, utilizing the blank on the opposite page, all physicians, but particularly those under 45 years of age, insure to every extent possible assignment to the type of service for which they are best fitted. They avoid thus also the possibility of unclassified service with the United States Army during the period that may be necessary following selection by the Selective Service before the commission can be secured. A physician called by the Selective Service who has not enrolled or who is not on a reserve list obviously serves without a commission during the time that necessarily elapses before a commission is secured. In future issues of *The Journal* announcements will be made regularly of the numbers of those who enroll and of the extent to which the immediate needs of the Army, Navy and other government agencies are being supplied.

ENROLLMENT FORM FOR PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS

DR. SAM F. SEELEY, Executive Officer
Procurement and Assignment Service
New Social Security Building
4th and C Streets S. W.
Washington, D. C.

Dear Doctor Seeley:

Please enroll my name as a physician ready to give service in the Army or Navy of the United States when needed in the current emergency. I will apply to the Corps Area commander in my area when notified by your office of the desirability of such application.

SIGNED.....

1. Give your name in full, including your full middle name:

2. The date of your birth:

3. The place of your birth:

4. Are you married or single?

5. Have you any children? If so, how many?

6. Do you believe yourself to be physically fit and able to meet the physical standards for the Army and Navy Medical Corps?

7. Have you filled out previously the questionnaire sent to all physicians by the American Medical Association?

8. When and where were you graduated in medicine?

9. In what state are you licensed to practice?

10. Do you now hold any position which might be considered essential to the maintenance of the civilian medical needs of your community? If so, state these appointments:

11. Have you previously applied for entry into the Army or Navy Medical Service? If so, state when, where and with what result (if rejected, state why).

SIGNATURE.....

ADDRESS.....

Date.....

DETACH HERE

CASE REPORTS

CLINICO-PATHOLOGICAL CONFERENCE

BOWMAN GRAY SCHOOL OF MEDICINE
OF WAKE FOREST COLLEGE

Clinical History

W. W., a Negro male, aged 30, was first admitted to the Vanderbilt University Hospital on January 26, 1938. He had been seen in the outpatient department in 1927 with the complaint of chronic tonsillitis and epistaxis. Tonsillectomy was advised. The second visit was in October, 1936, at which time it was noted that his mentality was poor, that the extremities were long in proportion to the torso, the fingers tapering, and that there was marked scantiness of facial and body hair. The hair present was of a feminine distribution. The penis was small, as were the testes. A follicular eruption with dryness and slight scaling of the skin was a conspicuous finding. The blood pressure was 102 systolic, 75 diastolic; there were 3,200,000 red blood cells and 8.5 Gm. of hemoglobin. A diagnosis of vitamin deficiency and hypogonadism was made. The patient was treated with some success for vitamin A deficiency. Anemia was refractory to treatment.

Since about 1936 the patient had noted weakness and dyspnea on exertion, and progressive slowing of his mental processes. Until a year and a half before admission he shaved regularly, but since that time hair had disappeared from his face, and he had noted further loss of pubic and axillary hair. He had severe epistaxis, for which the nasal mucosa was cauterized. Edema of the ankles and feet developed in 1937. This was apparently relieved by diet and the administration of yeast. For several months prior to admission he had noticed dizziness on change of position and great weakness when walking. He thought he had lost some weight, although his appetite and digestion had remained good. He had experienced a marked decrease in libido and had not had sexual intercourse for a year. His tolerance for cold weather had diminished.

Physical examination revealed a well nourished Negro male, who looked younger than his stated age. He was lethargic and the mental processes were slow. The skin was dry, rough, and inelastic, and bran-like desquamation was present over the areas exposed to trauma. The facial, axillary, and pubic hair was absent. The eyebrows were thin. The scalp hair was sparse, but there were no areas of baldness. The face was smooth and almost devoid of expression. Convergence of the bulbs was poorly performed; the fundi and eyes were normal. An ulcer was present on the nasal septum. The heart sounds were distant. The blood pressure was 100 systolic, 60 diastolic. The visual fields were normal. An infantile penis and very small testes were noted. The hips were of feminine contour.

Laboratory examinations showed the urine to be normal except for low specific gravity. On only one occasion did the specific gravity exceed 1.010. There were 2,600,000 red blood cells, with 7 Gm. of hemoglobin. The blood sugar was 60 mg. per 100 cc. A glucose tolerance test gave a blood sugar of 129 mg. per 100 cc. at the end of the first hour, 67 in two hours, 59 in three hours, and 48 in four hours. The cholesterol content of the blood was 156 mg. per 100 cc. The basal metabolic rate was -32 per cent. A gastric analysis showed no free acid after an alcohol meal, 7 cc. of free acid and 24 cc. of combined acid after histamine. The white blood cell count was persistently low, varying between 4000 and 5000, with an essentially normal differential count. The cerebrospinal fluid was normal in every respect.

During the patient's stay in the hospital his blood pressure varied between 105 systolic, 80 diastolic, and 80 systolic, 50 diastolic. His response to large doses of thyroid extract was poor and resulted in but slight elevation of the metabolic rate. He lost about 12 pounds in weight and vomited frequently. On attempting to go to the bath room he fell to the floor and apparently lost consciousness temporarily. Liver extract was administered in large quantities, and he gained weight, became more alert, and was ambulant at the time of his discharge, on May 24, 1938. A skull plate made during this admission revealed some flattening of the sella turcica and marked absorption of the posterior clinoid processes.

Following discharge the patient was seen several times in the clinic. His basal metabolic rate was recorded as − 41 per cent. The anemia did not recur; he continued to feel strong, and remained up and able to do

some work about the house. However, on the morning of July 7, 1938, he was found in bed in a convulsive seizure. He regained consciousness, only to experience a second convulsion. The only statement by the family of possible significance relative to these early morning seizures was that for several weeks he had appeared very weak during the early morning hours and had complained of excessive hunger.

He was admitted to Vanderbilt University Hospital in coma. The respirations were rapid and noisy, and a few convulsive movements of the face and arms were described. He was not sweating. Marked salivation was noted. A severe generalized convulsion occurred, lasting about a minute. The cardiac rate was 44, the blood pressure 90 systolic, 70 diastolic. The blood sugar was 25 mg. per 100 cc. Glucose and adrenalin were administered and he improved considerably. The respirations became less labored and he regained consciousness. Forty-five minutes later he was out of bed. He was given orange juice and sugar by mouth during the evening, but at 11 p. m. he again lapsed into coma. Increased salivation recurred. Twenty-five grams of glucose intravenously revived him within two minutes. A clysis of 2000 cc. of 5 per cent glucose was started. At 3 a. m. he again lapsed into coma, but after 25 Gm. of glucose intravenously he responded to questions. At 5 a. m. coma recurred. Fifty grams of glucose intravenously was given without effect, and at 8 a. m. his blood sugar was found to be 38 mg. per 100 cc. Adrenalin at fifteen minute intervals, saline and glucose by rectum, anterior pituitary extract and eschatin, thyroid and dessicated anterior pituitary extract by nasal tube, and caffein sodium benzoate were of no avail. The patient could not be revived, and he died on the evening of July 8, 1938.

Discussion

DR. ARTHUR GROLLMAN: The clinical history indicates a chronic hypophyseal deficiency, which began apparently in adolescence, leading to the eunuchoidism noted in the patient at the age of 19. Although it did not lead to the extreme cachexia associated with Simmonds' disease, the dysfunction of the pituitary induced the many symptoms—anemia, loss of the hirsutes, atrophy of the reproductive organs, digestive disturbances, hypotension, a greatly reduced basal metabolic rate, a markedly increased tolerance to carbohydrates, and attacks of hypoglycemia—which are characteristic of an insufficiency of the anterior lobe of the hypophysis. The pathologic disturbance responsible for the hypophyseal deficiency in this patient would appear to be one of the rarer conditions which give rise to Simmonds' disease. The clinical findings preclude a chromophobe adenoma or craniopharyngioma as likely causes. The rarer type of cyst arising in the pars intermedia, or some chronic infectious process would seem most likely. Although both of these conditions are extremely rare, they appear to be the only logical etiologic agents which might be responsible for the disorder as manifested in this patient.

In addition to the destructive process in the pituitary just described, one would anticipate finding at autopsy some residual functional anterior lobe tissue which would explain the absence of the extreme cachexia noted in the typical patient dying of pituitary insufficiency. The other glands of internal secretion may also be predicted to be extremely hypoplastic. The thyroid will be small and will lack its usual alveolar appearance, and the parenchyma will be replaced by fibrous tissue. The thymus will be absent; the parathyroids small. Although it will be very small and hypoplastic, the adrenal cortex should show no true degenerative changes such as are observed in Addison's disease due to cortical atrophy. The recurrent hypoglycemia shown by the patient was due to a failure of normal glucogenesis and not to any overactivity of the pancreatic islets. In fact one may predict the existence of a hypoplasia of the pancreas involving both acinous and islet tissues. The testes will be atrophic, with degeneration of both spermatic tubules and of the interstitial tissue. The accessory reproductive organs will be undeveloped and will resemble those observed in the castrate. The tissues and organs generally will also be small and hypoplastic. This microsplanchnia will be observed in the gastro-intestinal tract, heart, kidneys, and bone marrow. The changes in the last named tissue were responsible probably for the observed anemia.

Dr. Grollman's Diagnosis

Pituitary insufficiency (Simmonds' disease).

Pathological Diagnosis

Pituitary insufficiency (Simmonds' disease).

Pathological Discussion

DR. ROBERT P. MOREHEAD: This patient at autopsy showed findings compatible with the diagnosis of Simmonds' disease. A destructive process in the region of the hypophysis adequately explains the clinical picture as well as the accessory postmortem findings. A mass of yellowish tissue measuring 4 x 2 cm. was found to occupy the sella and to extend forward to the optic chiasma. A yellowish material exuded from the cut surface. The sella was enlarged and the dura surrounding the mass was thickened and firm. A definite line of cleavage could not be established between it and the new growth. Microscopic study revealed almost complete destruction of the hypophysis by a chronic granulomatous inflammatory process with the development of poorly formed tubercles. Numerous irregular cavities were found throughout the mass, filled with exudate containing a predominance of neutrophils. Sections stained for tubercle bacilli gave negative results.

The accessory findings relate to the endocrine system. All glands were smaller than normal. The adrenals weighed 4.5 Gm. each, giving definite evidence microscopically of hyperplasia but no evidence of atrophy. The prostate was very small and microscopic study revealed very little glandular tissue. The testes and thyroid presented a similar picture, the former weighing only 10 Gm. each and the latter only 15 Gm. The parathyroid glands were not identified and thymic tissue appeared to be absent.

The essential finding in this case is a destructive granulomatous inflammatory process involving the hypophysis and presenting a picture strongly suggestive of tuberculosis. The picture is perfectly compatible with that condition, although organisms were not demonstrated in the section. The infection may have originated in the primary complex and reached the hypophysis or sella by a hematogenous route. Active tuberculosis elsewhere was not demonstrated. It is perfectly proper to consider also the possibility of infection superimposed on a preexisting cyst of Rathke's pouch, with destruction of all structures by which we recognize this type of lesion.

Atrophy and hypoplasia of the remaining endocrine glands are best explained on the basis of disuse rather than absence of specific glandulotrophic hormones, since the latter have not been demonstrated.

CLINICO-PATHOLOGICAL CONFERENCE

CITY MEMORIAL HOSPITAL

WINSTON-SALEM

Presentation of Case

Mr. D. R. H., a 69 year old white man, was admitted to the City Memorial Hospital for the last time October 29, 1941, because of weakness and tarry stools. He died the following morning.

The family history revealed no tuberculosis or cancer. The past history and the review of systems elicited nothing pertinent. The patient had suffered from dyspnea for two or three years. Some nausea with epigastric discomfort had been experienced three or four years ago, but since then his appetite and digestion had been reasonably good. He had drunk little alcohol during his life. In February, 1937, he was operated on for an acute right mastoiditis and three months later was treated medically for acute otitis media. Results were good, although moderate deafness was noted during his final illness. The laboratory work done during these two admissions was essentially normal. The red cell count was 4,000,000, with 76 per cent hemoglobin. Urine examinations were negative.

The patient's present illness started suddenly on the night of July 21, 1941, when he awoke vomiting large amounts of blood. He had several grossly bloody stools, and was brought to the emergency room, pale, restless and weak but not in shock. The physical examination on this admission revealed an obese, pale, elderly man, somewhat dyspneic, and coughing. The temperature was 99.2 F., the pulse 88 and the respirations 24. The blood pressure was 115 systolic and 70 diastolic. There was generalized grade III arteriosclerosis. The heart was "quite large", with a localized "hemic" systolic murmur at the aortic area. The chest was clear throughout. The abdomen was soft and generally tender, especially in the epigastrium and left upper quadrant. The liver was not pal-

pable and no masses were found. There was moderate pitting edema of the extremities.

The patient's course in the hospital was quite uneventful. The stools, which were at first black, finally became light tan in color, showing only occult blood. The anemia responded to three 250 cc. blood transfusions and liver extract, after hemorrhage had apparently ceased. He vomited no blood after admission. He was finally discharged August 12, 1941, in apparently good condition. His blood pressure was 110 systolic and 68 diastolic.

Fluoroscopic examination on August 12, 1941, showed a slight left-sided enlargement of the heart and a slightly dilated aorta. The stomach and duodenum appeared normal. A gastric analysis on July 30 showed an absence of free hydrochloric acid before and after the test meal, with a maximum combined hydrochloric acid of 30°.

The following blood counts were made:

Date	*Red blood cells*	*Hemoglobin*	*White blood cells*
July 22	3,080,000	8 Gm.	5,600
July 25	2,540,000	7 Gm.	4,750
July 31	1,940,000	7 Gm.	3,650
August 8	2,700,000	8 Gm.	4,000

The albumin-globulin ratio was 1.1 and the total proteins 5.0 Gm. per 100 cc. There were 3.8 per cent reticulocytes before liver was given. No serological test for syphilis was done.

The final admission (October 29, 1941) followed "hemorrhaging" from the bowel of about two days' duration, but without vomiting. On admission he vomited dark coffee grounds material. The temperature was 97.6 F., the pulse 100 and the respirations 24. A blood count showed 4.75 Gm. of hemoglobin and 19,750 white blood cells. His urine gave a 4 plus reaction for sugar, but was otherwise negative. The patient appeared very pale and acutely ill on admission, and his condition grew steadily worse. He continued to vomit dark material and died at 8:30 the following morning.

Differential Diagnosis

DR. E. B. BROOKS: Among the conditions which may cause gastric bleeding are cancer of the intestinal tract, stomach ulcer, duodenal ulcer, diseases of the blood vessels, aortic aneurysm, dilated esophageal varices and telangiectases, and acute venous congestion caused by acute gastritis, enteritis, or passive congestion. Still other conditions which may cause vomiting of blood are syphilis, broncho-pulmonary lesions, blood dyscrasias, and splenomegaly. The most frequent causes of bleeding from the stomach are ulcer of the stomach or duodenum, and esophageal varices due to a cirrhotic liver. That would make us feel that this man had one of these two things.

People with stomach ulcers do not often die from the hemorrhage, and this man apparently did die from the hemorrhage. That would mean that the most likely possibility was cirrhosis of the liver with esophageal varices, or some other obstruction that would cause esophageal varices to form. A great number of deaths resulting from the vomiting of blood are due to rupture of esophageal varices, or to an aneurysm rupturing in the stomach. If an esophageal varix did not cause this man's death, there is a possibility that an aneurysm had ruptured in the stomach. It may have ruptured several months ago and then recurred two or three months later.

Since no Wassermann test was made, we do not know whether or not the patient had syphilis.

He did not have a broncho-pulmonary lesion. The lungs were clear. He had no splenomegaly or blood dyscrasia. I do not see how he could have had a cancer over such a long period of time without more symptoms. Whether he had some vague condition like miliary aneurysm or large aortic aneurysm and telangiectases I do not know. I should say that the most likely cause of death was rupture of a varix. My second guess would be an aneurysm.

DR. J. C. RODICK: It was very difficult to make satisfactory x-ray examination of this man. He was obese and quite ill. The stomach was of normal pattern and normal mucosa. There was a normal fundus. The small bowel seemed to contain no lesion at all. At times the duodenal cap looked distended. This might be evidence of an organic lesion, but it appears to be quite normal. The esophagus did not show any evidence of varices; however, this does not mean that he did not have a varix that ruptured.

DR. C. H. MCCANTS: What percentage of cancers of the stomach can you demonstrate with x-ray? Is it 100 per cent?

DR. RODICK: It is not that high. The cancer may be small and so situated that you

cannot see it. I think that we do miss those situated posteriorly in the upper half of the stomach. This man may have had an esophageal, gastric or duodenal lesion. However, the entire examination was negative for any organic lesion, except a slightly dilated heart and aorta, which might have been due to his age and obesity.

DR. H. M. STARLING: A patient with a penetrating ulcer might bleed to death. I think that this is said to be a rather frequent cause of death from peptic ulcers, particularly in older persons.

DR. R. V. WOLFE: How do you account for the absence of free hydrochloric acid?

DR. BROOKS: Older people on whom we have done gastric analyses have not had much free hydrochloric acid. We also noticed this finding in a number of patients with ulcers who had no symptoms whatever.

DR. W. L. GRIMES: Why was the blood count so high? The white cell count was almost 20,000. Was a differential done on this last count?

DR. S. S. MILES: No.

DR. BROOKS: He had had tarry stools. Blood in the stomach would give an elevation of white blood cells.

Clinical Diagnosis

Cirrhosis of the liver.
Rupture of esophageal varix.

Dr. Brooks's Diagnosis

Cirrhosis of the liver.
Rupture of esophageal varix.

Anatomical Diagnosis

Atrophic cirrhosis of the liver.
Rupture of esophageal varix.
Chronic atrophic gastritis.
Splenomegaly.

DR. T. T. FROST: The liver weighed 1470 Gm., the spleen 320 Gm. The liver showed an early but very definite atrophic cirrhosis without very much nodularity or reduction of liver size. The stomach showed an atrophic gastritis and was filled with blood, as was the rest of the small intestine. The blood resulted from the erosion of an esophageal varix.

DR. GRIMES: Was there no free fluid in the peritoneal cavity?

DR. FROST: No.

DR. GRIMES: Is that not very rare?

DR. FROST: No. The collateral circulation develops early in the disease and the ascites is a terminal event. The sections of the liver show some irregularities of the surface. There is some division into irregular lobules by connective tissue, which does not follow the anatomical liver lobules. Associated with it is a considerable amount of fatty infiltration. The stomach shows marked atrophy of the mucosa, which accounts for the absence of free hydrochloric acid. I do not believe that the age entirely accounts for the absence of hydrochloric acid The atrophy is greater than would be expected in a man of this age. The veins in the esophageal submucosa are greatly dilated. The spleen shows a diffuse fibrosis and thickening of the sinusoids. The capsule is considerably thickened. This man did not have any jaundice. There was nothing clinically that would suggest cirrhosis of the liver except one thing: the reduction of the albumin-globulin ratio which occurs in liver damage.

MEDICOLEGAL ABSTRACT

J. F. Owen, M.D., LL.B.
Raleigh

Hospitals: A nurse is not liable for injury caused by executing orders of a physician unless it is apparent that injury would result; where a nurse is not liable for injury to the patient the hospital cannot be held liable as her employer.

This is an action originally instituted against a hospital, an incorporated institution; a doctor, the lessee and operator of the hospital; and his wife, who was employed as Assistant Manager and Superintendent of Nurses. The hospital, however, filed an answer stating that the doctor defendant had leased the hospital and was operating it on his own account at the time the plaintiff sustained her injury; as a consequence no judgment was sought against the hospital. The facts in the case are as follows: The plaintiff in this suit gave birth to a child on January 6, 1929. After delivery she remained in a feeble condition, and on January 22, 1929, began having convulsions. Upon the advice of her family physician, who, it is noted, was not a party to the suit, the patient was sent to the hospital mentioned above for treatment in the "sweat cabinet" or radiation cabinet. The treatment was given by the Superintendent of Nurses in the presence of and under the direction of the patient's family physician. As far as can be determined from the records the doctor who was the lessee of the hospital was not present at the time the treatment was given. The treatment, it was alleged in the complaint, caused serious and painful burns, sloughing of the tissues, and serious and painful injuries.

The following facts were proved at the trial in Superior Court: 1. That the family physician was present, and that he directed and supervised the treatment. 2. That the appliance was an approved type and in general use. 3. That the nurse who gave the treatment was competent and possessed the required skill and exercised the degree of care which the law deemed essential. Despite these find-

ings the jury agreed that the injury was caused by the negligence of the defendants, as alleged in the complaint, and $29,975 was assessed as damages. A motion entered by the defendants as of nonsuit was denied by the trial judge. The defendants appealed to the Supreme Court.

When this case came on for consideration before the higher court it was the duty of this court to determine if a sufficient amount of evidence had been introduced to warrant presentation of the case to the jury. The Justice writing the opinion felt that the injuries complained of could result from one of the following causes: 1. That the body was improperly wrapped. 2. That the patient was suffering from some disease rendering her sensitive to the treatment. 3. That the patient was retained in the cabinet for an excessive period of time. It was proved at the trial that patients had been given this form of treatment previously in a nude condition and that no injury had resulted. This fact absolved the nurse from responsibility, as this was the only cause which could possibly implicate her in connection with the treatment administered. The other two possible causes would, of course, involve the question of diagnosis and judgment on the part of the family physician, who, as stated above, was not a party to the suit. The Court did not feel that the nurse was in any respect negligent, as shown by the evidence, and the Justice made the following remarks incident to his opinion: "Where an injury to a patient is not attributable to any negligence of the attending nurse, the owner and lessee of the hospital employing the nurse cannot be held liable on the doctrine of **respondeat superior.**" This means, of course, that if the nurse had been guilty of negligence in administering the treatment this negligence would have been imputed to the operator of the hospital and he also would have been liable for damages. The Court in this instance emphasized the fact that nurses in hospitals must of necessity obey and diligently execute the orders of the physician or surgeon in charge of the patient, and that they will not be held liable for injury resulting to the patient in the execution of such orders unless such instructions are so obviously negligent as to lead any reasonably prudent person to anticipate that substantial injury would result.

The Supreme Court reversed the judgment of the Superior Court, inasmuch as the evidence in the case was held insufficient to be submitted to the jury. The higher court felt that the motion for nonsuit duly made by the defendants should have been granted. (North Carolina Supreme Court, v. 202, p. 337. Decision rendered spring term, 1932.)

BULLETIN BOARD

PRESIDENT'S MESSAGE

December 24, 1941

Dr. F. Webb Griffith, President
North Carolina Medical Society
Asheville, N. C.

Dear Sir:

We appreciate your offer of the use of the President's column in the January issue of the NORTH CAROLINA MEDICAL JOURNAL, as contained in your letter of December 21, addressed to General Metts. Your letter has been referred to the writer for reply. The following comments seem apropos.

Physical Examinations: No doubt many of the physicians of North Carolina know that there has been a change in the method of conducting the physical examination of registrants, this new plan to be in operation by January 1, 1942. Under this plan, the local board physicians conduct a screening examination which is little more than a general inspection and consists in quickly sorting out those men that have readily discernible defects which are irremediable. The rest of the registrants requiring physical examination are then forwarded to an Army Examination Station, of which there are seven in this state at the following points: Asheville, Charlotte, Winston-Salem, Greensboro, Raleigh, New Bern, and Fort Bragg. Under this procedure there are two main advantages.

1. Registrants will know ten to twenty days prior to their expected date of induction whether they are physically fit for military service, and in this period can arrange their personal affairs so that they will suffer the least inconvenience because of their induction. Those men who are rejected will likewise not be inconvenienced.

2. The local physician will be saved a great deal of time, since he will not be called upon to do a duplicate examination. This is especially important at this time, since both the military requirements and the civilian needs must be met by a not too numerous physician personnel.

We are glad to lighten this load upon the examining physicians, who have borne it so well and have shown a fine spirit of patriotism.

Rehabilitation: Review of the physical examinations conducted in the past reveals the fact that there are a great many registrants who have remediable defects of greater or less degree, chief among which are dental defects. The rehabilitation of many of these men is not only desirable but may be accomplished at relatively little cost. The tentative plan of National Headquarters calls for these corrective procedures to be performed locally, and they are to become a large responsibility of the civilian physician and dentist.

Selective Service could not have operated without the wholehearted cooperation of many of our citizens, most of whom have labored without pay. Chief among this group stand the physicians who have been an integral part of every local board. We take this opportunity to express our gratefulness. We trust that we shall enjoy their cooperation and advice in the future as we have in the past.

For the State Director:

Yours very truly,
ELMUS D. PEASLEY
Major, Medical Corps
Medical Officer.

SECRETARY'S MESSAGE

Periodic self analysis is good for individuals and for institutions.

Take, for example, a medical society. It would be wise for each of our county medical societies, as it starts a new year, to take an inventory. The membership of each should ask itself such questions as: What is the society doing for its members? What is the society doing for the community? By sifting its activities in this manner each society can find its weaknesses and make plans for expansion where it is needed.

Does your society take a leading part in community affairs?

There are so many opportunities for the medical society in the average North Carolina community—opportunities for leadership and for giving advice in matters pertaining to health.

In these troublesome times there are many new responsibilities confronting the medical profession, many new functions for it to perform. Through its organization, the profession must be alert and equipped to take its place in civic affairs.

In this the first month of the New Year, I am insisting that each member pause long enough to ask, Where is our Society strong? Where is it weak?; to ask, Which activities can be curtailed and which functions should be expanded? Then see that the necessary changes are made.

—ROSCOE D. MCMILLAN, M.D.

MINUTES OF THE EXECUTIVE COMMITTEE MEETING

December 7, 1941—Raleigh

The Executive Committee of the Medical Society of the State of North Carolina met in Joint Session with the Executive Committee of the North Carolina Public Health Association in the Raleigh Room of the Sir Walter Hotel, Raleigh, on Sunday, December 7, 1941, at 11 a. m.

The meeting was called to order by Dr. F. Webb Griffith, President of the Medical Society of the State of North Carolina.

The following members were present:

Medical Society:
Dr. F. Webb Griffith, President
Dr. Donnell B. Cobb, President-Elect
Dr. Thomas DeL. Sparrow, First Vice President
Dr. Roscoe D. McMillan, Secretary-Treasurer
Councilors:
1st District—Dr. H. D. Walker
2nd District—Dr. G. W. Mitchell
5th District—Dr. J. G. Pate
6th District—Dr. George L. Carrington
7th District—Dr. Robert H. Crawford
8th District—Dr. James H. McNeill
9th District—Dr. I. E. Shafer
10th District—Dr. Harold S. Clark

Public Health Association:
Dr. R. E. Rhyne, President
Dr. Thomas Ennett, Vice-President
Dr. R. J. Sykes, Secretary-Treasurer
Dr. Carl V. Reynolds
Dr. M. T. Foster

Dr. R. J. Sykes of Raleigh, Secretary-Treasurer of the Public Health Association, presented for the consideration of the Executive Committee of the Medical Society of the State of North Carolina the following resolution:

> Resolved that the North Carolina State Medical Society be requested to start their meeting at two o'clock p. m. on Tuesday, May 12, 1942 instead of at two o'clock p. m. on Monday, May 11, 1942, thereby allowing the North Carolina Public Health Association an additional one-half day for its annual meeting. (1) Because of the growth of the Health Officers Association and its allied agencies. (2) Because it is impossible to transact all of the business of the Public Health Association in one day.

The resolution was a result of a meeting of the Executive Committee of the Public Health Association and an outgrowth of a discussion in regard to the meeting of the Public Health Association with the Medical Society of the State of North Carolina.

There followed a period of intense discussion in which Dr. Carl V. Reynolds, Secretary of the State Board of Health and State Health Officer, very ably stated the cause of the Public Health Association by relating the history of its growth from a personnel of a few people who served altruistically to the present outstanding organization of doctors, nurses, engineers, etc. He stressed the fact that the Medical Society and the Public Health Association should work together and stated that organized Medicine and Public Health were too closely allied to be weaned or divorced from each other.

Drs. Shafer, Mitchell, McNeill and Carrington, Councilors of the Medical Society, figured prominently in the round table discussion following Dr. Reynolds' remarks.

Dr. Ennett, Vice-President of the Public Health Association, remarked on the importance of the two organizations continuing to work together for the common cause of friendship, leadership and public relations.

Having presented their resolution, the Executive Committee of the Public Health Association retired, leaving the matter to be decided by the Executive Committee of the Medical Society of the State of North Carolina.

Upon motion of Dr. G. W. Mitchell, seconded by Dr. James H. McNeill, the Executive Committee of the Medical Society of the State of North Carolina, by unanimous vote, convened in Executive Session.

The resolution of the Public Health Association was discussed briefly and the following motion by Dr. James H. McNeill, seconded by Dr. G. W. Mitchell, was unanimously carried:

"That the Executive Committee deny the request of the North Carolina Public Health Association and notify them that we favor their meeting with us in the Conjoint Session at Noon on Wednesday; are agreeable to their beginning their meeting on Wednesday afternoon; and are willing to arrange our Sectional Meetings in such a manner that subjects in which they are interested will come on Wednesday, in so far as we can."

The subject of Exhibitors for the Annual meeting was discussed at length, particularly the matter of an open bar being maintained by one exhibitor at previous meetings. Dr. McMillan stated that this particular firm had not been asked to exhibit at the 1942 meeting. Dr. Griffith expressed his disapproval of the policies of that one firm. The following motion by Dr. Mitchell, seconded by Dr. McNeill, was unanimously carried:

"That we go on record as backing up the President and the Secretary in the matter of open bars being maintained by exhibitors at the annual meeting, and let the President and Secretary handle the matter in their own way."

President Griffith reminded the group that there was a vacancy on the Board of Trustees of the Hospital Saving Association, caused by the death of Dr. T. W. M. Long and, at Dr. I. H. Manning's request, suggested that Dr. Donnell B. Cobb, of Goldsboro, be elected to fill the vacancy. Upon motion of Dr. J. G. Pate, seconded by Dr. R. H. Crawford, Dr. Cobb was elected to membership on the Board of Trustees of the Hospital Saving Association by unanimous vote of the Executive Committee.

The subject of rearranging the program for the Annual Meeting of the Medical Society so that all committee work and non-essentials could be taken care of on Monday afternoon and the Monday night meeting reserved for nomination of officers and essential work was introduced. In the discussion which followed it was brought out that such a change could not be made according to the By-Laws. The subject was deferred to be brought up at the meeting of the House of Delegates.

The dates of the annual meeting were brought up for confirmation by Dr. McMillan, and, upon motion of Dr. Shafer seconded by Dr. Mitchell, it was decided by unanimous vote to hold the meeting on May 11, 12 and 13, 1942.

The request presented by Dr. McMillan for Dr. W. H. Smith, Chairman of the Postgraduate Committee, for a donation of $75.00 to be used in obtaining a speaker for each district meeting was discussed, but no action was taken.

Upon motion of Dr. Mitchell, seconded by Dr. Cobb, it was unanimously decided to donate $250.00 to be used by the Cancer Control Committee.

Dr. McMillan suggested that the $10,000 which the Society now has on savings be used to buy Defense Bonds. Upon motion of Dr. Crawford, seconded by Dr. McNeill and amended by Dr. Mitchell, it was decided by unanimous vote to invest the whole amount in accumulative Defense Bonds, and the Secretary-Treasurer was instructed to buy in $1,000 lots, or in denominations as nearly that as possible.

Following a discussion of the payment of dues by men in active military service, President Griffith appointed Dr. McMillan and Dr. Mitchell as a committee to study the feasibility of waiving dues and of refunding dues and to report to the House of Delegates in May, 1942.

There being no further business to come before the Committee, the body adjourned subject to the call of the President.

News Notes From the University of North Carolina

At the Annual Meeting of the North Carolina Pathological Society on December 16, 1941, the following program was presented in the Medical Building, Chapel Hill.

1. Paget's Disease of the Mandible—Dr. Walter Summerville.
2. The Effect of Carbon Tetrachloride and Hepatic Resection on the Development of Cancer of the Liver in Rats Following Ingestion of P-Dimethylaminoazobenzene—Dr. Clark Brown.
3. Epidemiology and Pathology of Kidney Worm —Drs. H. W. Brown and Russell Holman.
4. Studies on Experimental Brucellosis — Drs. Forbus, Goddard, Brown and Margolis.

Dinner, 6:00 p. m., Carolina Inn

8:00 p. m.—Hypertension—Dr. Arthur Grollman, Bowman Gray School of Medicine of Wake Forest College.

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Dr. Wm. deB. MacNider attended a meeting of the Examination Committee of the National Board of Medical Examiners, of which he is Chairman, on December 7, 1941, in Philadelphia.

* * *

The School of Medicine and the Extension Division of the University of North Carolina, in cooperation with the local county societies, have arranged for four postgraduate courses during the winter and early spring at Fayetteville, Durham, Raleigh and Kinston. The programs for the courses at Durham and at Fayetteville are as follows:

Durham, every Wednesday from January 14 to February 18—Watts Hospital.

Clinics at 5 p. m., dinner at 7 p. m., evening lecture at 8 p. m.

January 14:

1. Obstetrics—Dr. M. P. Rucker, Richmond.

January 21:

2. Clinical-Pathological Conference—Dr. Francis Wood and Dr. Baldwin Lucke, University of Pennsylvania.

January 28:

3. The Failing Heart of Middle Life—Dr. W. D. Stroud, Philadelphia.

February 4:

4. The Use of Sulfonamides in General Practice —Dr. Harrison Flippin, Philadelphia.

February 11:

5. Surgery—Dr. R. B. Cattell, Lahey Clinic, Boston.

February 18:

6. Pediatrics—Advances in the Treatment of Infectious Diseases in Children—Dr. Charles F. McKhann, University of Michigan.

Fayetteville, every Thursday from January 22 to February 26—Veterans Hospital.

Clinics at 5 p. m., dinner at 7 p. m., lecture at 8 p. m.

January 22:

1. Diagnosis and Treatment of Common Diseases of the Gastro-Intestinal Tract—Dr. Walter C. Alvarez, Mayo Clinic.

January 29:

2. The Failing Heart of Middle Life—Dr. William D. Stroud, University of Pennsylvania.

February 5:

3. Endocrinology and Metabolism in General Practice—Dr. Charles E. Paullin, Atlanta, Ga.

February 12:

4. Orthopedic Problems of the General Practitioner—Dr. Custis Lee Hall, Washington, D. C.

February 19:

5. Advances in the Treatment of Infectious Diseases in Children—Dr. Charles F. McKhann, University of Michigan.

February 26:

6. Infectious Diseases of the Genito-Urinary Tract—Dr. P. S. Pelouze, University of Pennsylvania.

The programs and schedules for the courses at Raleigh and Kinston, which follow immediately after those held in Durham and Fayetteville, will be announced in the next number of the **Journal.**

* * *

Dr. D. A. MacPherson, of the Department of Bacteriology of the School of Medicine, attended a meeting of the Society of American Bacteriologists in Baltimore, December 28, 29, and 30.

* * *

Dr. James C. Andrews, of the Department of Biological Chemistry of the Medical School of the University of North Carolina, has been requested by the Editorial Board of the **Annual Review of Biochemistry** to write the review on "The Chemistry and Metabolism of the Compounds of Sulfur" for Volume XIII. The **Annual Review of Biochemistry** consists of reviews of the status of various topics in biological chemistry written by different research workers. These latter are selected by the editorial board for their familiarity with the topic under consideration.

* * *

Dr. James M. Mackintosh, who has held many important positions in public health in England and Scotland, including that of Chief Medical Officer of Scotland, and who is now Professor of Preventive Medicine at the University of Glasgow, was in Chapel Hill in December. Dr. Mackintosh gave a talk for the faculty and students of the Schools of Public Health and Medicine.

* * *

Dr. Donald H. Williams, Director of the Division of Venereal Disease Control in Vancouver, was in Chapel Hill the early part of December, and visited the School of Public Health.

* * *

A Seminar sponsored by the Division of Sanitary Engineering of the North Carolina State Board of Health, in connection with the new Hotel and Cafe Rules and Regulations, the new Code and the new score sheet and methods of grading, was held at Chapel Hill on December 12 and 13. The personnel of Health Units and Departments of the State and students of the School of Public Health attended the seminar.

* * *

Dr. Harold W. Brown, Dean of the School of Public Health, attended a meeting of the Association of Schools of Public Health in New York on December 20, 1941.

News Notes From the Bowman Gray School of Medicine of Wake Forest College

The Bowman Gray School of Medicine has been selected as one of the institutions to conduct scientific research on the prevention and treatment of war wounds. For several months Dr. Herbert S. Wells of the Department of Physiology has, in collaboration with the National Research Council, been studying the prevention and treatment of shock. A grant of $1250 has been awarded to Dr. Arthur Grollman, Research Professor of Medicine, by the Office of Scientific Research and Development for investigation of certain synthetic substitutes in medicine.

* * *

At the request of the Association of American Medical Colleges, the Bowman Gray School of Medicine has adopted a program which will allow medical students to graduate in three calendar years. The summer vacation will be eliminated, and school will be continuous over four quarters. The freshman class will begin work about June 15. A request to increase the enrollment will also be met.

* * *

Dr. Wingate M. Johnson, Clinical Professor of Medicine, has been made secretary of the new Section on General Practice of the American Medical Association.

* * *

The Private Diagnostic Clinic began operations January 1, with quarters on the first floor of the Medical School building. The following doctors constitute the personnel of the staff:

Medicine:
- Dr. George T. Harrell, Jr.
- Dr. Wingate M. Johnson
- Dr. Robert L. McMillan
- Dr. John R. Williams, Jr.

General Surgery:
- Dr. Howard H. Bradshaw
- Dr. William H. Sprunt
- Dr. A. deT. Valk

Neurosurgery:
- Dr. Henry G. Schwartz (After July 1st)

Neuropsychiatry:
- Dr. Elbert A. MacMillan
- Dr. John A. Rose

Dermatology:
- Dr. William L. Kirby

Obstetrics and Gynecology:
- Dr. Frank R. Lock

Pediatrics:
- Dr. Leroy J. Butler

Endocrinology:
- Dr. Arthur Grollman

Orthopedics:
- Dr. Robert A. Moore

Otolaryngology:
- Dr. James A. Harrill

Ophthalmology:
- Dr. W. Paul Speas

Urology:
- Dr. Fred K. Garvey

Radiology:
- Dr. J. P. Rousseau

Mr. Clyde T. Hardy is Business Manager of the Clinic.

NEWS NOTES FROM THE STATE BOARD OF HEALTH

Dr. Carl V. Reynolds, State Health Officer, has received the following telegram from Dr. Thomas Parran, Surgeon General, United States Public Health Service:

"In view of the present emergency, urge proper officials in charge of domestic water supplies to take immediate steps against sabotage by excluding all unauthorized persons and visitors from water works properties, to provide guards at danger points and places where sabotage may interrupt continuous maintenance of supply and to set up chlorine dosages to maintain a residual sufficient to provide disinfecting action throughout the distributing system. Letter follows."

Replying, Dr. Reynolds telegraphed Dr. Parran:

"We raised chlorine residual content water plants over State last summer. Later we began insisting on pre and post chlorination in numerous sections and are now endeavoring to extend this over State. We are communicating your message re: precautions against sabotage by quickest methods. Await your letter containing further instructions. North Carolina State Board of Health, backed by press, radio and public sentiment, solidly behind you in all-out health program to cooperate with any emergency."

NORTH CAROLINA OBSTETRICAL AND GYNECOLOGICAL SOCIETY

The North Carolina Obstetrical and Gynecological Society held its annual winter meeting in Charlotte on December 5. The following program was given:

X-Ray Studies of the Pelvis and Fetal Pelvic Relationship (Case Reports) — O. Hunter Jones, Charlotte.

X-Ray Visualization of the Fallopian Tubes (Case Report)—W. Z. Bradford and Wallace B. Bradford, Charlotte.

Analysis of Cesarean Section in Charlotte—Ernest Franklin, Charlotte.

Use of X-Ray in Obstetrics—Oren Moore, Charlotte.

NORTH CAROLINA COUNCIL ON NURSING DEFENSE

A meeting of the Nursing Council on Defense, Katherine Rehder, Chairman, and Mrs. Marie B. Noell, Executive Secretary, was held at Headquarters Office of the North Carolina State Nurses' Association December 20, 1941, at 11 o'clock.

The immediate consideration of the Council is the recruitment of well-qualified young women for enrollment in good schools of nursing. January will be known as National Nursing Month. It is believed that many well-prepared prospective student nurses can be secured by having speakers visit all high schools and colleges in North Carolina.

The North Carolina League of Nursing Education is planning to encourage all nursing schools in the state to hold "Open House" for prospective student nurses.

The North Carolina Nursing Council on Defense will cooperate with the local Red Cross Chapters in training Volunteer Red Cross Nurses Aids Corps, giving Red Cross Home Nursing Courses and giving courses in First Aid.

The Council is urging all graduate registered nurses to register for volunteer services with the county defense councils volunteer service.

THIRD DISTRICT AND SAMPSON COUNTY MEDICAL SOCIETIES HOLD JOINT MEETING

The Third District Medical Society and the Sampson County Medical Society held a joint dinner meeting in Clinton on December 2. Following dinner, the scientific program was presented by Drs. Tinsley Harrison, H. H. Bradshaw, and LeRoy J. Butler, of the Bowman Gray School of Medicine of Wake Forest College. Dr. Harrison spoke on "Cardiovascular Emergencies", Dr. Bradshaw on "Cancer of the Lung", and Dr. Butler on "The Care of the Premature Infant". Short talks were also made by Dr. F. Webb Griffith, President of the State Medical Society; Dr. Roscoe McMillan, Secretary of the State Medical Society; Dr. John B. Wright of Raleigh, and Dr. J. B. Sidbury of Wilmington, past presidents of the State Medical Society; Dr. Wm. M. Coppridge, President of the State Board of Medical Examiners; Dr. G. M. Cooper, Assistant State Health Officer; Brigadier General H. C. Coburn, Chief Medical Officer of Ft. Bragg; Col. E. D. Quinnell, Chief Medical Officer of Camp Davis, and Dr. B. A. Cockerell, Chief Medical Officer of Veteran's Hospital, Fayetteville.

At the business session the following officers of the Third District Medical Society were elected for 1942: Dr. J. Street Brewer, Roseboro, President; Dr. A. N. Johnson, Garland, Vice President; Dr. W. P. Starling, Roseboro, Secretary-Treasurer. Dr. Starling was also elected President of the Sampson County Medical Society; Dr. J. M. Lee, Newton Grove, was elected Vice-President, and Dr. G. E. Best, Clinton, Secretary-Treasurer.

Officers of the Third District Medical Society for 1941 were Dr. W. C. Mebane, Wilmington, President, and Dr. S. C. Cox, Kerr, Secretary-Treasurer. Dr. W. Houston Moore, Wilmington, is Councilor of the Third District. Dr. J. H. Williams, Clinton, was President of the Sampson County Medical Society for 1941, and Dr. W. P. Starling was Secretary-Treasurer.

TENTH DISTRICT MEDICAL SOCIETY

The fall meeting of the Tenth District Medical Society was held in Burnsville on November 26. Among those who took part on the afternoon program were Drs. Frank C. Wood of Marion, C. N. Burton of Asheville, R. O. Jones of Burnsville, W. M. Russell, Julian A. Moore, G. F. Parker, Irma Henderson-Smathers, B. E. Morgan and J. H. Doughtery of Asheville, V. H. Duckett of Canton, W. E. Brockett of Hendersonville, and Roy C. Tatum of Knoxville, Tenn. Guest speakers at the dinner meeting were Dr. F. Webb Griffith of Asheville, Dr. Roscoe D. McMillan of Red Springs, and Dr. Oren Moore of Charlotte. Officers elected for 1941 were: Dr. B. E. Morgan of Asheville, President; Dr. Frank Wood of Marion, First Vice President; Dr. L. L. Williams of Spruce Pine, Second Vice President; Dr. J. R. Westmoreland of Canton, Third Vice President; Dr. J. L. McElroy of Marshall, Fourth Vice President; Dr. C. E. Hoover of Murphy, Fifth Vice President. Dr. D. M. McIntosh, Jr., was reelected Secretary-Treasurer.

Retiring officers of the society are: Dr. A. B. Greenwood of Asheville, President; Dr. Candler A. Willis of Enka, First Vice President; Dr. F. H. Richardson of Black Mountain, Second Vice President; Dr. E. W. Schoenheit of Asheville, Third Vice President; Dr. A. E. Gouge of Bakersville, Fourth Vice President; and Dr. R. O. Jones of Burnsville, Fifth Vice President.

Buncombe County Medical Society

At the first December meeting of the Buncombe County Medical Society, held on December 1, Dr. James H. Cherry gave a paper on "Vitalium Cup Hip Arthroplasty". The discussion of this paper was opened by Dr. George A. L. Inge of Knoxville, Tennessee, and Dr. John T. Saunders. Following the meeting a reception was held in the new clinic of Drs. Saunders and Cherry.

On December 15 the annual business meeting and banquet of the Society was held at the Biltmore Forest Country Club.

Forsyth County Medical Society

The annual business meeting of the Forsyth County Medical Society was held in Winston-Salem at the Robert E. Lee Hotel on December 9. Dr. Robert R. Garvey was elected President of the Society; Dr. Robert L. McMillan and Dr. W. deKalb Wylie, Vice Presidents; Dr. Carlton N. Adams, Secretary; and Dr. Howard Starling, Treasurer. Following the dinner and the business meeting Dr. Robert L. McMillan addressed the Society on "Typhus Fever, and the So-Called Q Fever".

Halifax County Medical Society

The Halifax County Medical Society met on December 12 at the Roanoke Rapids Hospital, Roanoke Rapids. Dr. Barnes Woodhall of Duke University presented a paper on "The Diagnosis and Treatment of Sciatica". Officers elected for 1942 were Dr. Robert F. Young of Halifax, President; Dr. W. G. Suitor of Weldon, Vice President; Dr. W. D. Hall of Roanoke Rapids, Secretary-Treasurer.

Polk County Medical Society

At the December meeting of the Polk County Medical Society recent communications from the National Physicians' Committee were discussed, and Dr. William St. J. Jervey, who has been associated with his father, Dr. A. J. Jervey, since July, was received into membership.

Randolph County Medical Society

The members of the Randolph County Medical Society and their wives met at the home of Dr. and Mrs. R. P. Sykes in Asheboro for the annual banquet and election of officers on December 3. The following officers were elected for 1942: Dr. Tiffany Barnes of Asheboro, President; Dr. M. B. Smith of Ramseur, Vice President; Dr. Dennis B. Fox of Randleman, Secretary-Treasurer; Dr. J. H. Soady of Asheboro, Delegate to the State Medical Society; and Dr. G. H. Sumner of Asheboro, Alternate.

Union County Medical Society

The Union County Medical Society held its annual meeting for the election of officers on December 8. Dr. J. G. Faulk was elected President, succeeding Dr. Clem Ham; Dr. F. N. Andrews, First Vice President; Dr. C. A. Bolt, Second Vice President; Dr. W. M. Love, Secretary; and Dr. J. W. Ormand, Delegate to the State Medical Society, with Dr. J. J. Goudelock as alternate.

Watts Hospital

The annual meeting of the former members of the Resident Staff of the Watts Hospital in Durham was held on Friday, December 5, at the Hospital. There was an unusually good attendance of the former members of the staff. After the business session in the morning and a luncheon at the Hospital, the following program was presented at the scientific session in the afternoon:

The Value of Gastroscopy in Demonstrating Small Stomach Lesions—Dr. W. W. Vaughan, Radiologist, Watts Hospital.

Malignant Tumor of Thymus Gland—A Report of a Case—Dr. E. B. Cekada, Durham.

The Diagnosis and Treatment of Tularemia—Dr. Davis L. Moore, Winterville.

Prognosis and Results of Treatment of Portal Cirrhosis—Dr. Ralph G. Fleming, Mayo Clinic.

Pathology of the Adrenal Glands — Dr. Arthur Grollman, Bowman Gray School of Medicine of Wake Forest College, Winston-Salem.

Mississippi Valley Medical Society 1942 Essay Contest

The Mississippi Valley Medical Society offers annually a cash prize of $100.00, a gold medal, and a certificate of award for the best unpublished essay on any subject of general medical interest (including medical economics) and practical value to the general practitioner of medicine. Certificates of merit may also be granted to the physicians whose essays are rated second and third best. Contestants must be members of the American Medical Association who are residents of the United States. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Quincy, Illinois, September 30, October 1, 2, 1942, the Society reserving the exclusive right to publish the essay first in its official publication— the **Mississippi Valley Medical Journal** (incorporating the **Radiological Review**). All contributions shall not exceed 5000 words, be typewritten in English in manuscript form, submitted in five copies and must be received not later than May 1, 1942. The winning essay of the 1941 contest appears in the January, 1942, issue of the **Mississippi Valley Medical Journal** (Quincy, Illinois). Further details may be secured from

Harold Swanberg, M.D., Secretary,
Mississippi Valley Medical Society,
209-224 W. C. U. Building, Quincy, Illinois.

Postgraduate Courses in Obstetrics

Five postgraduate courses in obstetrics, each of four weeks' duration, will be offered at the Chicago Lying-In Hospital between January 12 and June 6, 1942. These are sponsored by the Illinois State Department of Health and the Children's Bureau of the U. S. Department of Labor. The features of the program consist of observations on current managements of normal and abnormal states of the pregnant, parturient, and puerperal patient. Lectures, demonstrations, clinics, and other teaching means augment the operating room and birth room observations, and ward round discourses. The course is run on a non-profit basis. A deposit of $25.00 is required on registration, $10.00 of which is refunded at the completion of the course. All the members of the department participate in giving the courses. Additional information and application blanks may be obtained by request from Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

Office of Civilian Defense

The national emergency has brought about a shortage of nurses in hospitals, clinics, public health and field nursing agencies. To relieve this situation, which is likely to grow more acute with the expansion of military establishments and of plans for civilian defense, the American National Red Cross and the Office of Civilian Defense have jointly undertaken a project to train volunteer nurses' aides. With such assistance, graduate nurses may extend their services to many more persons. The volunteer aides will work under supervision of a nurse and are being trained for certain nontechnical tasks in order that graduate nurses may be released for the highly technical duties they alone are qualified to perform.

Sanitary Requirements For School Lunches

The Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, recognizing the increasing importance of school lunches, adopted a statement on the sanitary requirements for school lunches at its regular annual meeting, held at Atlantic City, February 25, 26, 1941.

Single copies of this statement are distributed gratis by the Joint Committee through its Secretary, W. W. Bauer, M.D., 535 North Dearborn Street, Chicago. Quantities will be furnished at actual cost; prices quoted on request. Requests for free copies must be made on the official letterheads of school systems or public health agencies.

Fourteenth Anniversary Issue of the Hebrew Medical Journal

The attention of the medical profession is directed to the appearance of a special issue (Volume I, 1941) of **The Hebrew Medical Journal (Harofe Haivri)**, a semi-annual publication, edited by Moses Einhorn, M.D. This volume commemorates the fourteenth anniversary of this Journal, and presents a valuable symposium on "Diabetes Among Jews." The participants of the symposium are medical men with prominent reputations in their field. They include such men as Drs. Joslin, Morrison, Frederick F. Allen, A. Rudy, A. J. Rongy, Charles R. Bolduan, A. A. Epstein, and others.

In addition to an English-Hebrew medical dictionary, the original articles are summarized in English, to make them available to those who are unable to read Hebrew.

For further information, communicate with the editorial office of The Hebrew Medical Journal, 983 Park Avenue, New York City.

News Notes

Dr. W. J. Lackey of Fallston is Chairman of the Section on General Practice which was organized at the 1941 meeting of the Southern Medical Association.

* * *

Dr. Roland Bellows of Charlotte has been certified by the American Board of Neurological Surgery.

* * *

Dr. Samuel P. Ravenel of Greensboro spoke before the Marlboro County Medical Society, meeting at Bennettsville, South Carolina, on January 7. His subject was "Practical Points in Pediatric Practice". Dr. Robert A. Ross of Durham and Dr. Harry Winkler of Charlotte discussed other papers given at this meeting.

Dr. Thomas Huffines of Asheville has been made a Fellow of the American College of Surgeons.

* * *

Dr. William Earle Grady of Tryon died on December 9, 1941.

* * *

Dr. William Henry Pettus, Jr., surgical resident at Duke Hospital from 1937 to 1941, has moved to Charlotte to be associated with Dr. Marvin Scruggs and Dr. L. E. Fleming in the practice of surgery.

* * *

Dr. J. P. U. McLeod of Marshville has announced that the "McLeod Clinic", opened October 4, 1941, was accepted for full membership in the North Carolina Hospital Associtaion on December 4.

* * *

Dr. Upshur Higginbotham has moved from Roanoke Rapids to Montgomery, West Virginia, where he will be medical chief in one of the local hospitals.

* * *

Dr. Philip B. Parsons has moved from Charlotte to Norfolk, Virginia, where he will continue the practice of radiology.

* * *

Dr. Foy Roberson of Durham was elected Vice President of the Southern Surgical Association at its recent meeting in Pinehurst.

* * *

Dr. Oren Moore of Charlotte spoke before the Third District Medical Society of South Carolina on November 18 at the State Training School, Clinton, South Carolina. His subject was "Minor Disorders of Pregnancy".

A lucrative field is left open by the death of a general practitioner: an attractive clinic and equipment for rent in a field that will yield $1,000 a month to the right person. If interested, communicate with Mrs. T. A. Smith, 2226 Plaza, Charlotte, North Carolina.

The "Sulfa" Drugs

In 1937 sulfanilamide became available generally and proved to be extremely useful in the treatment of infections due to B. hemolytic streptococci and meningococci. In addition, the drug soon was being employed in urinary tract infections, trachoma, chancroid, lymphogranuloma venereum, and certain cases of gas gangrene, and it demonstrated some benefit in gonorrhea, undulant fever, and actinomycosis. Approximately two years later sulfapyridine was being widely used in the treatment of pneumococcal infections and was found to be more effective than sulfanilamide against gonococci. After only another year sulfathiazole began to replace sulfapyridine because it was as effective against pneumococci and gonococci, more effective against staphylococci, and occasioned fewer reactions. In urinary tract infections sulfathiazole was superior to sulfanilamide in most cases. Now sulfadiazine is being introduced and it has the advantage of a lower index of toxicity, which makes possible the maintenance of high blood levels.

This group of drugs has become exceedingly widely employed. Soon there will be only a small proportion of the general population which has not received one of them as treatment of some variety of infection (South. M. J., 34:1214, 1941). It behooves the physician to choose carefully the most specific and least toxic one for his case. A wide variety of dosage forms have been made available by Eli Lilly and Company.

AUXILIARY

HISTORY OF THE STUDENT LOAN FUND

The possibility of creating a loan fund to provide for the education of the children of North Carolina doctors who by some circumstance might need a temporary loan was first discussed by the Auxiliary in May, 1930. Three years later, in Raleigh, April, 1933, the Auxiliary Loan Fund came into being.

At the present time, the Auxiliary, acting through its Executive Board, appoints a Loan Committee of three members, and no loan is made from the Student Loan Fund until approved by the Loan Committee. The Committee at the present time is composed of Mrs. John S. Hooker, Chairman of the Student Loan Fund; Mrs. Sidney Smith, President of the Auxiliary; and Mrs. E. C. Judd, Treasurer of the Auxiliary. The members of the Loan Committee serve for a period of two years each.

Loans from this fund are available to sons and daughters of North Carolina doctors and are limited to $100.00 per year for two years to one individual. For each loan the borrower gives a note to the Auxiliary, signed by himself, his parents, and two other sureties. The note is payable on or before one year after the date of graduation, with interest from the maturity of the note at the rate of 5 per cent per annum, subject to the provision that no interest shall be charged if the note is paid promptly at maturity.

The Auxiliary goal for the fund is $10,000, but the fund at present is $630.04. In the past eight years the fund has been made available to:

Miss Genevieve Whittington of Snow Hill —1935

Miss Margaret Knight of Greensboro—1935, 1936

Miss Eula Grace Whittington of Snow Hill—1936

Miss Margaret Whittington of Snow Hill —1937

At the present time Charles Highsmith of Dunn, who is at George Washington University, and Charles Whittington of Snow Hill, who is a Senior at State College, both have loans.

County auxiliaries and doctors' wives who are members-at-large are urged to make generous contributions to the Student Loan Fund to enable this fund to widen its benefits.

In Memoriam

CASPER WALKER JENNINGS, M. D.

It is with a profound sense of loss that we record the passing of a true and trusted friend. Casper Walker Jennings was born in Danville, Virginia, November 11, 1893. At the age of 5 years he moved to Greensboro with his family. After graduating from Greensboro High School he entered the Medical College of Virginia, where he received the degree of Doctor of Medicine in 1916. He did general practice in West Virginia for two years, at the end of which time he entered Manhattan Eye, Ear, Nose and Throat Hospital, where he did special work for one year. In 1920 he established practice in his specialty in Hot Springs, Arkansas. Five years later he returned to Greensboro, where he remained until his death, November 22, 1941.

Dr. Jennings, or "Casper" as we all affectionately called him, took every opportunity to improve his knowledge. He frequently took time off from a busy practice to attend clinics and seminars in the medical centers. He seldom missed a meeting of this Society. He was past president of the North Carolina Otolaryngological Society. He was a member of the American Medical Association, the Medical Society of the State of North Carolina, and the Guilford County Medical Society, and for a number of years was the very able treasurer of this society. In 1918 he was married to Miss Marjorie Lea, to which union three children were born. Casper was a popular member and past president of the Greensboro Lions Club.

His pleasing personality, ready wit and unfaltering loyalty won for him a warm spot in the hearts of all who knew him. Though his familiar, friendly, and often homespun witticisms were known and appreciated by all his friends, and though his jovial disposition bespoke a "happy-go-lucky", care-free attitude, he was a man of firm conviction, and when the occasion arose he did not hesitate to stand for what was right. The affection with which his memory is cherished by all who knew him is his noblest monument. We, his associates, his friends, join his family in mourning his untimely departure.

—The Guilford County Medical Society.

BOOK REVIEWS

Occupational Diseases, Diagnosis, Medicolegal Aspects and Treatment. By Rutherford T. Johnstone, A.B., M.D., Director of the Department of Occupational Diseases, Golden State Hospital, Los Angeles, California; Formerly Assistant Professor of Medicine, University of Pittsburgh School of Medicine. 558 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1941.

The modern growth of industrial activity has rendered some knowledge of occupational diseases essential even to the general practitioner. This is particularly true in areas like North Carolina, which in recent years has been converted from a purely agrarian to a semi-industrialized region. The first part of the present volume is devoted to the legal aspects of Workmen's Compensation as related to the physician. There follow sections dealing with the effects of gases, solvents and fumes, metals and dusts. Chapters are devoted to such disorders as hernia, backache, dermatoses, and cancer, associated with certain occupations. The final section deals with medicolegal relationships of trauma to disease, malingering, and pre-employment examination. Any physician whose practice includes patients in industrial employment will find in the present volume a lucid presentation of important practical problems which are usually not stressed in the conventional medical texts.

A Primer for Diabetic Patients. By Russell M. Wilder. Ed. 7, 184 pages. Price, $1.75. Philadelphia and London: W. B. Saunders Co., 1941.

The successful management of any case of diabetes is dependent not only on the physician but also on the patient's intelligence and capacity to follow the necessary dietary, therapeutic and hygienic regimen. It is for this reason that education of the diabetic is an essential part of treatment. Wilder's little book is intended to aid in this process. It is written in a clear and non-technical language and should admirably fulfill the purpose for which it was written. The present edition includes the practice introduced by Lawrence, Archer and Graham of London, of injecting both protamine zinc and regular insulin through the same syringe. This is now a routine procedure in the larger clinics, but in the reviewer's experience has not been adopted, as it should be, in diabetic practice generally.

Acknowledgment of Diabetes.—Diabetes should be acknowledged by those who have it. It is not a disease to be ashamed of unless one has been informed that he or she is hereditarily disposed and yet has become fat. One in four of all the people in the country has a diabetic relative.—Elliott P. Joslin: Diabetic Hazards, New England J. Med. 224:590 (April 3) 1941.

Gastrointestinal Upsets in Patients Taking Insulin.—Gastrointestinal upsets often are the precursors of a reaction. During such episodes, patients should always take some carbohydrate at frequent intervals, electing the form that can be best retained—tea or coffee with sugar, milk and Vichy water, ginger ale or similar preparations.—Elliott P. Joslin: Diabetic Hazards, New England J. Med. 224:590 (April 3) 1941.

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